THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
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# COMPUTERWORLD

## 1-2-3 users unimpressed by upgrades

*Bugs, missing pieces spark dissatisfaction*

BY PATRICIA KEEFE
CW STAFF

Concessions to backward compatibility in new releases and upgrades to previous versions of Lotus Development Corp.'s 1-2-3 are starting to get in the way of some user satisfaction.

In particular, bugs and missing features in the recently shipped 1-2-3 for Windows have disappointed long-patient users and have caused Lotus to announce plans for a bug fix, as well as a 1.1 release in early 1992. Also, innovations such as the Smarticons added to 1-2-3 for Windows have let down some users who want them added to 1-2-3 for OS/2.

According to beta-test users and analysts, 1-2-3 for Windows is heavily based on old 1-2-3 Version 3.1 code.

**User problems**

Among the problems cited are the inability to wrap long text lines into a single cell, inconsistencies importing spreadsheets from DOS-based 1-2-3 into the Windows version, no automatic column width optimization, no outlining and no Object Linking and Embedding support. It also does not read Excel macros.

Other Lotus users who have only recently received the

*Continued on page 8*

## RDBMS makers recast pricing

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — A pricing revolution is sweeping the relational database industry, with the upshot being simpler licensing schemes but potentially higher costs for some users.

Oracle Corp. early this month joined Sybase, Inc. and Informix Software, Inc. in switching to per-user pricing schedules for some of its products (see chart). Ask Computer Systems, Inc.'s Ingres Products Division is also considering per-user pricing for its database products, according to a spokesman.

Digital Equipment Corp. is said to be evaluating new pricing models for its RDB relational database.

Per-user pricing bases software license fees on the number of users who use a package rather than the size of the machine it runs on. The pay-as-you-go plan is generally favored by users, many of whom feel trapped by traditional schemes that have tied hardware upgrades to steeper price tags.

"Pricing by the box was a bone of contention among Oracle users for the last two years," said Carmine Tedesco, a project

*Continued on page 12*

**Pay as you go**

*Relational DBMS vendors are flocking to per-user pricing*

| Company | Policy | When started |
|---|---|---|
| Informix Software, Inc. | All database products | March 1990 |
| Sybase, Inc. | All database products | Sept. 15, 1991 |
| Oracle Corp. | Unix database products | Oct. 1, 1991 |
| Ask Computer Systems, Inc.'s Ingres Division | No per-user pricing | Under evaluation |

CW Chart: Marie Haines

## Freed Bells eye data services dollars

BY GARY H. ANTHES
and ELLIS BOOKER
CW STAFF

WASHINGTON, D.C. — The seven regional Bell operating companies were long on enthusiasm but short on specifics last week after a federal appeals court here knocked down — at least for now — the last barrier to their entry into information services markets.

The Baby Bells cheered a court decision that reversed part of a July 25 order by U.S. District Judge Harold H. Greene, who ruled that the companies could offer information services but told them to hold off to give opponents time to appeal his decision. Last week the appeals court gave the RBOCs an immediate green light, saying there was insufficient evidence that Greene's order lifting the

*Continued on page 10*

**Bells break loose**

*A federal appeals court decision could allow regional Bell operating companies to provide a plethora of information services*

- Through a simple set of commands, users could access news, stock quotes and other services.
- Large companies could tap the RBOCs to transfer funds electronically.
- Businesses could electronically peruse information found in today's Yellow Pages.
- Students could call up multimedia lectures from home.

## LAN rivals seek parity with Novell

*Microsoft, Banyan add features but lag leader*

BY JIM NASH
and ELISABETH HORWITT
CW STAFF

With their newest barrage of announcements, Microsoft Corp. and Banyan Systems, Inc. may finally be catching up technologically to Novell, Inc. and its giant ally, IBM. However, analysts said Microsoft and Banyan are still struggling just to stay in the race with the local-area network market leader.

The biggest LAN rivals treated information systems managers to new products and operating system upgrades at last week's Interop '91 show in San Jose, Calif., with Banyan saving its best shot for this week at Networld '91 in Dallas. Novell and Apple Computer, Inc. also announced new products last week (see chart page 6):

- Banyan promised much-needed integration between its Vines operating system and IBM's Systems Network Architecture. This week, it is expected to announce Vines 5, which will include long-awaited Apple Macintosh support.
- Microsoft will announce Macintosh support and finally catch up with both Novell and Banyan in the remote server access department.

*Continued on page 6*

## Comdex to rewrite pen-computing book

BY JAMES DALY
CW STAFF

LAS VEGAS — Pen-based computing will be a highlight of Comdex/Fall '91 as several companies — including IBM — offer a sneak peek at prototype pen machines while dozens of others exhibit applications that use an electronic stylus as the major input device.

Additionally, Lotus Development Corp. is expected to announce a new applications division that will build spreadsheets for Penpoint, a pen-based operating system from Go Corp.

Comdex attendees can also get a first look at many horizontal "pencentric" applications, including Wordperfect Corp.'s Penperfect word processor, Pensoft's Personal Information Manager organizer application and start-up Ink Development Corp.'s Inkware, which allows the capture of both written and visual images. Microsoft Corp. is also arranging early looks at Windows 3.1, which will include handwriting-recognition capabilities when it arrives later this year.

PI Systems Corp. in Portland, Ore., will establish itself as the front-runner in providing the entry with the lightest weight and lowest price. Its Infolio model is expected to weigh less than three pounds, cost under $2,000 and squeeze up to 15 hours of power out of six AA batteries when it ships in the first quarter of 1992. It will run its own proprietary operating system and will be powered by Motorola, Inc.'s MC68331 small systems processor.

The flurry of pen-based

*Continued on page 120*

COMDEX PREVIEW

NEWSPAPER

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**IBM faces controversy** over third-party software that migrates System/36s to RS/6000s. Page 119.

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## Quotable

*"If you told me I had to sell either the airline or the system, I'd probably sell the airline."*

ROBERT CRANDALL
AMERICAN AIRLINES

*On legislation that would force American to divest itself of its Sabre reservation system.*
*See story page 4.*


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## The 5th Wave

# EXECUTIVE BRIEFING

■ **Computing ethics remains a little-discussed topic** among IS managers, despite the personal, professional, corporate and legal importance. Debate about electronic mail monitoring, data access and other privacy issues remains largely the province of academicians, consultants and associations. However, recent well-publicized cases involving alleged E-mail monitoring and awareness campaigns by the American Civil Liberties Union, the Electronic Mail Association and others have begun to draw more attention to the issue. **Page 83.**

■ **Relational database vendors are moving quickly to per-user pricing,** bringing order to what has been a chaotic software pricing scene. Per-user schemes charge by the number of users of a package and not by processor size. The change should give users less confusion and more control over their checkbooks. **Page 1.**

■ **Downsizing is worth the effort,** but expect some resistance, say two successful downsizing practitioners. The users say downsizing requires a major management commitment and should start on a high-profile project. **Page 4.**

■ **One company expects to save $3 million a year** using distributed AS/400s to replace its mainframe services. The idea behind such an approach is that replacing a minicomputer or mainframe with several small networked AS/400s can save money without sacrificing performance. **Page 93.**

■ **PCs get smaller and smaller,** and next week's Comdex show will be the place to see them. Several notebook computer makers will show color displays, and notepad computers you can write on will be there in force. **Page 120.**

■ **The Baby Bells are free to offer information services,** but most say they aren't ready yet. Database providers are up in arms about last week's sudden lifting of an injunction against the RBOCs, and a move is already afoot in Congress to reimpose restrictions. **Page 1.**

■ **Local-area network users** will feast on newly announced enhancements from Novell, Microsoft, Apple and Banyan. Multiprotocol support is a common theme of the new products, although everyone still seems to be scrambling to keep up with Novell. **Pages 1, 6 and 7.**

■ **The U.S. Supreme Court won't hear** Robert Morris' appeal of the Internet worm case decision. The decision leaves a law on the books that may penalize people who inadvertently violate a computer's security. **Page 14.**

■ **IS professionals who move from the central IS nest** to user departments find the transition far from smooth: Getting used to a nontechnical boss and a whole new culture takes some time. **Page 105.**

■ **Videoconferencing is set to soar** as lower prices and better technology make it possible for electronics to take the place of expensive business trips. **Page 99.**

■ **The retail sector is moving to a new plateau in its use of technology,** with customer service being the key motivator. IS managers for retail chains see the old cash register becoming a networked workstation with links to the corporate host. **Page 31.**

■ **The Federal Communications Commission wants users to speak up.** The FCC chairman and users who have made the effort to voice their opinions say users can impact the FCC's decisions. **Page 59.**

■ **A Japanese/American automotive joint venture** has IS staff members thinking long-term and sharing information across the enterprise. Exercises at 7:30 a.m. can work in America, they say. **Page 71.**

"I need to downsize. They said they could help. But then they said I had to get all new PCs. They said their database wasn't compatible with my mainframe DBMS. They even said I would need to re-write all my applications. I said,

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# Users: Downsizing gain is worth the pain

BY CLINTON WILDER
CW STAFF

CHICAGO — Two leading Midwestern manufacturers report successful results with their downsizing plans — but not without having to overcome organizational resistance.

Executives at TRW, Inc. and Harley-Davidson, Inc., speaking at the Society for Information Management's annual conference last week, said they have saved money and empowered users by moving selected applications from mainframes to networked personal computers. But they warned that companies must make a commitment to the migration because mistakes will be made in the beginning.

"The pain comes before the gain," said Donald J. Logan, vice president of information resources at TRW in Cleveland. "We recognized that this could not be evolutionary. We had to take a revolutionary step."

TRW and Harley-Davidson have plenty of company, according to a survey of Fortune 500 firms taken six months ago by the Meta Group, Inc., a research and consulting firm in Westport, Conn. Ninety percent of the firm's clients said they plan to move some mainframe applications to smaller platforms during the next 18 to 24 months. A substantial 23% said they plan to eliminate mainframes in favor of minicomputer-based servers, mostly running Unix, during that time.

In TRW's case, the transition to smaller platforms began in 1987 with a major commitment to deemphasizing centralized corporate information systems control. The corporate IS staff was cut from 240 people — one quarter of all corporate staff — to 110. When the decision was made to start downsizing applications, the corporate staff was halved to 55. Responsibility for depreciation of IS assets was moved from the corporate books to TRW's diversified business units.

Surprisingly, both TRW and Harley-Davidson found resistance from the very end users they intended to empower.

"We expected IS to be more resistant than the users, but that wasn't the case," said Jeffrey Bleustein, executive vice president at Harley-Davidson. "Getting end users to take the responsibility for their own systems is not always easy."

Harley-Davidson is in the midst of a two- to three-year migration from IBM mainframes to Application System/400s and personal computers. It was motivated by a four-year backlog of mainframe application requests that would have been even longer if users had not stopped issuing them out of frustration, according to Bleustein.

### At best and worst

"IS was viewed as a bottleneck at best and a roadblock at worst," Bleustein said. The Milwaukee-based motorcycle manufacturer plans to save 35% annually in processing costs when migration is complete, he added.

Bleustein advised other companies initiating applications downsizing to start with basic but visible applications, such as general ledger. "You can develop a system in three months — seven times faster than on the mainframe — and everybody's happy," he said. He added jokingly, "With general ledger, the finance department has a new thing to play with and won't look so hard at other requests."

TRW chose payroll and human resources modules for its pilot downsizing applications, and Logan estimated that development was eight to 10 times cheaper than it would have been on a mainframe.

"It's also a tremendous opportunity for re-engineering the business," Logan said. "It gets a lot of people trained in process evaluation as you go through it."

The general message of the "Life Without Mainframes" panel that included Logan and Bleustein was that firms planning to downsize should not be discouraged by initial resistance.

"You will get accelerated willingness to go along as this thing moves forward," said panelist Joseph Izzo, vice president of Chicago-based consultancy A. T. Kearney, Inc. "Don't base next year's expectations on last year's experiences."

# Crandall attacks curbs on reservation systems

BY CLINTON WILDER
CW STAFF

CHICAGO — AMR Corp. Chairman Robert Crandall is one of business' biggest advocates of information technology, but he believes government and technology do not mix.

Crandall, speaking and receiving an award at the Society for Information Management (SIM) annual conference last week, confirmed his reputation as a pull-no-punches top executive. He attacked the federal government on two fronts: proposed federal legislation requiring airlines to divest reservation systems and the Federal Aviation Administration's (FAA) woeful track record in modernizing its technology.

Some members of Congress have proposed that airlines be forbidden from owning computerized reservation systems because they constitute unfair advantage in the marketplace. American Airlines' Sabre system is the largest and most profitable such system.

"I have yet to figure out what's unfair about our investing $350 million in a risk that turned out to be successful," he told the approximately 400 attendees. "I don't think it's unfair that some other airlines opted out [of the reservation systems business] and we didn't."

Crandall cast another vote for the significance of information systems to American when he said, "If you told me I had to sell either the airline or the system, I'd probably sell the airline."

Crandall called the government "profoundly inept in everything it does" when asked to comment on the FAA's efforts to upgrade its antiquated information systems. He blamed the problems on the bidding rules for government contracts.

"In times like these, we as a nation are not rich enough to indulge in equity above all else as a way of doing business," Crandall said. He serves on an Office of Management and Budget task force overseeing the FAA systems effort.

Crandall and Max Hopper, American's senior vice president of IS, received a SIM Partners in Leadership Award for developing an integrated workstation used by American employees to share messages, information and multimedia applications.

A second award went to Bankamerica Corp. Executive Vice President Larry McNabb and Senior Vice President Bruce Fadem for the bank's Customer On-Line Information Network linking 850 bank branches. The award winners were announced in August.

# CW editors appointed

*Computerworld* has named Alan Alper to the post of news editor and has promoted James Connolly to the newly created position of technology editor.

Alper's primary duties include editing the weekly news pages. He has more than 11 years of computer journalism experience.

Previously, Alper was executive editor at *Computer Systems News*, where he directed that publication's weekly news-gathering operations and oversaw its annual survey of top systems integrators.

Before that, Alper served as *Computerworld*'s Mid-Atlantic correspondent for more than two years. Alper has also been a reporter for the *Computer Industry Daily* and *Electronic News*.

Alan Alper

James Connolly

In his new position, Connolly will oversee *Computerworld*'s technical sections, including Advanced Technology, Systems & Software, PCs & Workstations, Networking, Manager's Journal and Computer Industry.

He has 20 years of journalism experience, including nine years at *Computerworld*, where he most recently held the position of assistant news editor. Previously, he was a reporter at the *Boston Herald*.

## CORRECTIONS

Bell Atlantic Corp. has not purchased American Management Systems [*CW Premier 100*, Sept. 30]. American Management Systems remains independent, and the firms have formed a partnership to operate a systems integration venture.

.....

Andy Pulgise, vice president of IS at Service Merchandise Co. holds the firm's top IS post [*CW Premier 100*, Sept. 30].

.....

Continental Bank's outsourcing contract is with IBM; First City Bancorp's, with Electronic Data Systems Corp. They were reversed in a chart [CW, Sept. 30].


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**Main Editorial Office**
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171
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# ORACLE SERVER FOR NETWARE WENT TO SARA LEE AND HAD THE COMPETITION FOR DESSERT.

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*"While each product competing in the shootout displayed strength in one area or another, ORACLE Server was at or near the top in nearly every competition.*

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*—PC Week June 24, 1991*

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# LAN rivals

FROM PAGE 1

While customers said the announcements were just what they wanted, the two rivals are following Novell's lead two years late, said Craig Burton, chief executive officer at Salt Lake City consulting firm Clarke Burton Corp.

"Novell continues to draw ahead because it has good technology, a good infrastructure, control of distribution channels, a large customer base and momentum," he added.

In addition, the Provo, Utah-based vendor's rivals are finding it increasingly difficult to bring out all the advanced features users require in a timely fashion, Burton said.

Banyan, for example, is "two years behind everyone else" in supporting OS/2 clients. Apple Macintosh support from Microsoft, announced last week, and Banyan, announced this week, comes about two years after Novell, he added.

Microsoft's systems software senior vice president, Steve Ballmer, admitted that his company is trying to equal Netware with its new LAN Manager 2.1. Ballmer said Novell will continue to up the ante, and it is Microsoft's task to take control of the game by leapfrogging Netware features.

One of the more obvious cards being played is remote network access. Apple and Microsoft are expected to announce this week the ability for end users to dial directly into machines on their network via ordinary phone lines.

In both cases, the companies say users will have all the functions and rights they would have if they logged on from their workstation in the office. That ability has been a part of Netware for some time.

Likewise, Microsoft is offering full access to Macintosh networks as well as to Netware servers. Netware has sported a loadable module connecting Macintoshes to Novell networks in its 386 product line.

Banyan and Microsoft are also following in Novell's footsteps on the IBM connectivity path.

Banyan last week announced a relationship with Digital Communications Associates, Inc. The firm said it expects within 15 months to introduce a Vines-based SNA server that supports both 3270 and peer-to-peer connections to IBM systems.

Last week, Microsoft announced enhancements to Select Communications Server, a LAN Manager-based SNA server that it already markets through Document Content Architecture.

Meanwhile, both Banyan and Microsoft moved into Apple's turf by announcing the long-awaited support for Macintosh clients. This gives their customers the option of consolidating their Macintosh LAN services onto either Microsoft's LAN Manager or Vines.

Such a move is economically attractive to Fleet Bank of Massachusetts NA, which uses Vines as its "standard network" but also has several clusters of Macintoshes using Appleshare, according to Tim Allen, network administrator at the bank. "I don't have anything against Appleshare, but why bother with it?" — particularly when Apple boxes make expensive, nonoptimal network servers, according to Allen.

However, such moves constitute little threat to Apple, which is busy selling Macintoshes and welcomes enhanced Macintosh connectivity from any vendor, Burton said.

Appleshare, which supports neither Microsoft Corp. DOS nor OS/2, is specifically a Macintosh networking operating system and not a big revenue producer for Apple, he added.

## NOVELL, INC.

Network managers were upbeat last week when they learned of Novell's efforts to make servers at least part-time wiring hubs. However, Novell, while pushing the new technology, has yet to announce pricing or availability for software that takes advantage of it.

Administrators said Novell's proposal could reduce the laps they must run around their building looking for the source of wiring hub problems.

The Provo, Utah-based networking firm last week began championing the idea of moving hubs, or concentrators, out of wiring cabinets and onto Netware Version 3.11 servers. Managers said the idea has several advantages, namely, putting Simple Network Management Protocol-based hubs where network administrators more often work — at the server.

Novell announced a new driver interface in hopes of encouraging makers of manageable hubs to build them on interface cards for vacant Netware server slots. A spokesman for Novell said the company has developed a hub management driver interface that will link hub companies' cards and drivers with Netware 3.11 servers.

Many hardware vendors announced support for the interface, among them Intel Corp., Cabletron Systems, Inc., 3Com Corp., David Systems, Inc., Synoptics Communications, Inc. and Ungermann-Bass, Inc.

Neither the driver interface, which will run as a Netware loadable module, nor Hubcon, a Netware management utility, has been assigned prices or shipping dates.

Novell has said it expects new cards to be tested for Netware compatibility and to ship in three to four months.

Duane Murray, vice president and general manager of Novell's Network Management Products Division, said moving hubs onto cards in servers should lower per-port costs from approximately $150 to about $50 before adding in the cost of the management module.

"This could save me a lot of running around," said Karen Billingsley, a computer specialist at the Small Business Administration in Fresno, Calif. Today, Billingsley explained, she must physically unplug each Arcnet cable between daisy-chained hubs and between workstations and hubs to find out which port is not working.

The new Netware software, according to Murray, would enable administrators to monitor basic statistics of each hub on the network and each port on the hub. With it, managers would also be able to turn off and on each port.

Avo Amirian, former leader of the Los Angeles-area Netware users' group, said combining servers, hubs and management software should reduce a day-long project for some large offices to a half-hour task.

JIM NASH

## Gang of four

Local-area networking companies are rolling out new and enhanced products this month

### Microsoft®

**Percent of installed LAN operating systems:** 23.7%

**Percent planning to expand existing LANs within two years:** 10.2%

**New Products**

**LAN Manager 2.1**
- Microsoft LAN Manager Remote Access Service.
- DOS or Windows phone-line hookups to LAN Manager nets.
- 3270 emulation or APPC application access to mainframe via office network and DCA/Microsoft Select Communications Server.

**LAN Manager Services for Macintosh**
- File and print services over Localtalk, Token Ring or Ethernet.
- Automatic backup/restore of Appletalk volumes on LAN Manager server.
- Postscript printer support.
- Equal, simultaneous server access for PCs and Macintoshes.

**LAN Manager Toolkit for Visual Basic**
- Networking utilities.

**TCP/IP Utilities for LAN Manager**
- TCP/IP host access through terminal emulation.
- File transfer and remote command utilities.

**LAN Manager Version 2.0 for Unix**
- Single version of LAN Manager for Unix.
- Compatibility with OS/2 LAN Manager.

### NOVELL.

**Percent of installed LAN operating systems:** 69.6%

**Percent planning to expand existing LANs within two years:** 57.4%

**New Products**

**Novell hub management interface**
- Combines hubs with servers to improve manageability.
- Number of ports limited only by hub cards and slots in each server.
- Single interface for hub vendors to support.
- Basic management and statistics for each hub card and port.

### Apple

**Percent of installed LAN operating systems:** 23.2%

**Percent planning to expand existing LANs within two years:** 7.4%

**New Products**

**Appletalk Remote Access**
- Requires System 7.0.
- Phone access to Appletalk networks running on Localtalk, Ethernet or Token Ring.
- Increased security options, including user name and password authentication.

**Appleshare Server 3.0**
- Requires System 7.0 (minimum 4M bytes RAM).
- Added password security, including password aging and history.
- Administrative messaging.
- Application launch control.

### BANYAN

**Percent of installed LAN operating systems:** 12.2%

**Percent planning to expand existing LANs within two years:** 9.4%

**New Products**

**Vines Server-to-Server SNA Option**
- Allows Vines servers to communicate to peers over an SNA backbone.

**Agreement with Digital Communications Associates, Inc.**
- Vines version of DCA's Irmlan/EP gateway that will provide MS-DOS and Windows 3.0 clients transparent access to IBM 3270-to-mainframe connections.
- Vines server software to provide DOS, OS/2, Windows, Macintosh and Unix clients with access to IBM mainframes (available in 15 months).

**Vines 5**
- Support for Macintosh clients.
- Universal file system supporting Macintosh, DOS, OS/2, Windows and Unix.

Installation figures based on a Business Research Group survey of 400 LAN administrators. Some sites reported more than one LAN installed.

CW Chart: Michael Siggins

## BANYAN SYSTEMS, INC.

Banyan Systems is filling in two long-standing gaps in its enterprise local-area network strategy: support for IBM's Systems Network Architecture (SNA) and support for Apple Computer, Inc. Macintosh clients.

This week at Networld '91 in Dallas, Banyan is expected to announce Vines Version 5, a source close to the company confirmed.

Last week, the company announced SNA connectivity for Vines servers, along with a joint development alliance with leading IBM 3270 terminal-emulation vendor Digital Communications Associates, Inc. (DCA).

The two big breakthroughs offered by the new version are Macintosh support and a new file system that will allow a wide range of client systems to access the same files transparently on a Banyan server, several sources said.

"Banyan has been getting a lot of flack for not having full Macintosh support," said Bob Lem, a senior associate at consulting company Boston Systems Group. Currently, Macintoshes need a dedicated personal computer-based gateway from a third party to access Vines services. This method is expensive and slow, and it limits the types of Vines services that are available to Macintoshes, according to users.

The Universal File System which is slated to be announced with Vines 5 will make it possible for the full range of Vines clients to access the same files, Lem said. Lem also said he expected Vines 5 to include network

management software for managing problems and resources on distributed Vines servers.

For example, "when a server ran out of disk space, it would warn the administrator."

Vines 5 is also expected to provide remote dial-up connections to Vines servers from a remote console. "That would be great for network administrators that want to change backup cycles or reconfigure the server over our existing [wide-area network]," said Tim Allen, a network administrator at Fleet Bank of Massachusetts, NA.

Several users said they welcomed the promised added functionality that Banyan's alliance with DCA will bring to Vines' micro-to-mainframe links. Banyan's current 3270 emulation offering "is not the friendliest of interfaces, and maybe the DCA platform will be more robust, too," Allen said.

Within 15 months, the two companies said they plan to introduce a Vines/SNA-based communications server that will support peer-to-peer as well as 3270 micro-to-host links, Banyan said. Banyan also announced software to allow Vines servers to communicate over IBM SNA backbones.

However, several users said they wanted to keep their LAN interconnects separate from their SNA backbones. Fleet Bank "has an established WAN infrastructure," using servers as bridges, Allen said. "We don't need server-to-server SNA."

ELISABETH HORWITT

## MICROSOFT CORP.

With LAN Manager Version 2.1, Microsoft is aiming to get "over the bar" set by networking competitor, Novell, Inc., Microsoft senior vice president Steve Ballmer said in a briefing last week.

However, merely meeting the Novell mark does not mean LAN Manager will win widespread approval from information systems managers, many of whom are still smarting from the abrupt withdrawal of 3Com Corp., a major LAN Manager licensee, from the local-area networking market.

The revision, which will be available by year's end, includes connections to several new platforms, not the least of which are Novell Netware servers (see chart). New applications shipping as part of LAN Manager 2.1 include LAN Manager Remote Access Service, LAN Manager Services for Macintosh, LAN Manager Toolkit for Visual Basic and TCP/IP Utilities for LAN Manager.

Each can be purchased separately or together in a 10-user server package for $1,995.

Larry Page, director of information systems at Jacobsen Textron in Racine, Wis., said he is glad of the enhancements but they do not change his commitment to Novell.

"Novell looks like the long-term player to us," he said.

Page said he would welcome products from Microsoft that are strong enough to justify standardizing on LAN Manager, but this week's introductions do not settle his qualms.

The notion that most of a company's software needs — from desktop to nework operating systems and integration software — could be met by Microsoft alone is a seductive one, Page and other users said.

However, few users contacted said they were willing to wager their tight budgets that the Redmond, Wash.-based company will be a dominant networking player in the near future.

"Microsoft understands applications," said Ted Klein, president of Boston Systems Group, Inc., a Boston consultancy. "Microsoft does not understand networks. They are spinning their wheels keeping up with Novell."

Analyst John Girton at Van Kasper & Co. in San Francisco said he thinks Microsoft still has a chance to become a credible competitor to Novell, and LAN Manager 2.1 helps that cause.

JIM NASH

## APPLE COMPUTER, INC.

Apple is expected this week to unveil software enabling end users to remotely access any machine on their networks over common telephone lines. Apple is also scheduled to announce Appleshare Server Version 3.0.

The Cupertino, Calif.-based company is one of the last major computer companies with its toe in the networking market to offer remote network access. Industry observers said they consider such capabilities "critical" for Apple.

Macintoshes running System 7.0 will be able to link to Appletalk networks on Ethernet, Token Ring and Localtalk. "That is not essential for our firm," said Brian Woods, manager of value-added reseller services at Alpha Graphics in Tucson, Ariz., "but it's critical for Apple."

Alpha, a retail chain of print services, has little need to remotely access a network, according to Woods. The firm uses third-party software that offers at least some remote-access capabilities, he said.

But more of these features must come from Apple rather than from outside vendors in order to maintain compatibility.

Appleshare Server increases the number of concurrent users on the server software from 50 to 120, according to an Apple spokesman. It also bundles file servers and print servers, which previously had been sold separately.

JIM NASH


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# NEWS SHORTS

## IBM names CIO

IBM named Gerald Prothro, a 22-year veteran who has held a variety of jobs at the company, as its new chief information officer last week. Prothro has had a series of staff and management jobs at IBM and for the past year has served as assistant general manager of IBM U.S. Education. Prothro replaces Larry Ford, who now serves as head of System Software Associates, Inc., a player in the IBM Application System/400 market.

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## BT net manager gets OSI stamp

British Telecommunications PLC's Concert Integrated Management System last week became the first network management platform to be certified by the Open Systems Interconnect Network Management Forum as fully compliant with the forum's protocols. Several other vendors' platforms are now going through testing, the forum said. In addition, IBM and BT announced first-quarter 1992 shipment of a product that will allow Concert and IBM's Netview to exchange alerts. The link will not be based on OSI and will gain more functionality in time, an IBM spokesman said.

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## Wang wins patent case

A U.S. Federal District Court in Alexandria, Va., has ordered Toshiba Corp. and NEC Corp. to stop the manufacture, use, sale and distribution in the U.S. of two single in-line memory module products that infringe on patents held by Wang Laboratories, Inc. The court's order took effect on Oct. 8. In earlier proceedings, the district court had ordered Toshiba to pay Wang $2.4 million in damages, plus interest, and NEC to pay Wang more than $850,000 in damages, plus interest.

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## HP Series 700s to go retail

Hewlett-Packard Co. plans on establishing retail outlets for its Series 700 workstations next year. The company will assign field personnel familiar with Unix-based systems to reseller channels. Buying workstations through retail outlets is thorny because retail personnel are usually familiar only with DOS-based systems, but by using its own "workstation channel consultant" at each reseller, HP intends to authorize 100 outlets by the end of 1992.

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## CA turns on PC jets

Computer Associates International, Inc. is once again targeting the microcomputer software arena for a big push. Last week, it introduced three Microsoft Corp. Windows-based products: Dbfast, a multiuser, Dbase III-compatible database management system; CA-Phips, an image processing system; and CA-Superproject, a project management system compatible with DOS and Digital Equipment Corp. VAX versions. More product announcements are expected later this month at Comdex/Fall '91.

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## Informix readies RDBMS release

Informix Software, Inc. is expected to unveil a major new release of its Online relational database next January. Informix 5.0 reportedly will offer connectivity features that support distributed database architectures and enforcement of referential integrity. The package is expected at about the same time Oracle Corp. begins shipping Version 7.0 of its relational database. Seven beta-test sites have already received Informix 5.0, including longtime Informix user Rush-Presbyterian-St. Luke's Medical Center in Chicago.

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## DG expands Aviion low end

Data General Corp. expanded the low end of its line of Unix-based Aviion servers last week by announcing the AV 4300 series. The 25-MHz 4300 series offers both uni- and dual-processor systems and supports from 16M to 128M bytes of memory. The system is available immediately, with prices starting at $13,995.

*More news shorts on page 119*

# Interop attendees assess WAN options

BY JOANIE M. WEXLER
CW STAFF

SAN JOSE, Calif. — On a crowded Interop '91 trade show floor last week, users started unraveling the intricate web of alternatives emerging in high-speed wide-area data networking.

Confronting users were frame relay and Switched Multimegabit Data Service (SMDS), two approaches to handling high-speed local-area network interconnections and other bandwidth-demanding wide-area applications.

Pledges by vendors such as Bellcore, the development arm of the regional Bell operating companies (RBOC), to provide frame-relay services alongside SMDS and RBOC SMDS pricing and availability previews put the technologies in perspective.

The disclosure that SMDS will initially roll out at T1 speeds rather than the faster target of 45M bit/sec. muddied the issue for some users, however.

"I don't know exactly what the difference between frame relay and SMDS is," confessed Walter Thoma, an engineer at Vienna-based Bank of Austria. "When I talk to vendors, they say they don't know the advantages of the technology they're not offering; they can speak to one, but not the other."

### Big savings

Frame relay is a fast form of packet switching that offers cost savings by reducing the number of access ports and communications lines needed for multiple wide-area connections.

SMDS is strictly a public-switched alternative that offers the advantage of on-the-fly switching among any nodes within a given service area.

SMDS service availability is an issue for Jim Givens, data communications manager at the University of Missouri, who intends to deploy a private frame-relay network using Timeplex, Inc. equipment. "I don't see SMDS being available in our area for a while; if it were, I'd like to use it for backup," Givens said.

"It's cost that will drive all this stuff," said Isaac Eida, assistant vice president of network technology at Merrill Lynch & Co. in New York. "Right now, the cost of SMDS is too high from the public carriers."

The first hint of SMDS pricing came at last week's show from Bell Atlantic Corp., which said it intends to file "in a matter of weeks" SMDS tariffs in Philadelphia and Pittsburgh for $500 per month per access line plus an $800 installation charge.

Network service provider Compuserve, Inc. announced the pricing structure for its public frame-relay service last week. At T1 speeds, prices range from $1,200 to $5,456 per month per location plus locally tariffed access line charges.

Jennifer Pigg, a senior analyst at Boston-based consulting firm The Yankee Group, said that although SMDS prices could seem lower, the technology requires the user to buy digital service units priced between $6,000 to $10,000 each. "Frame relay is here, and it's cheaper," Pigg said. "Both technologies will hit T3 speeds at about the same time. I'm waiting for someone to say you can do X, Y or Z with SMDS and not with frame relay, but I'm not hearing that."

# 1-2-3 users

FROM PAGE 1

product said they have encountered few problems.

Also somewhat disappointing, users said, is the latest release of 1-2-3/G, now renamed 1-2-3 for OS/2 1.1. It is not a 32-bit application and lacks some of the flash of 1-2-3 for Windows.

"OS/2 is still one of our strategic desktops, but Windows is definitely the priority right now," OS/2 product manager Chris Wraight said. He claimed G is the best-selling OS/2 application to date, estimating its installed base to be about 10% of the OS/2 installed base.

That market may be shrinking. A number of former 1-2-3/G users abandoned 1-2-3/G after OS/2's drive for market acceptance fizzled. Some have long since shifted to Windows.

"One of our thrusts is to do a 32-bit version and to have it out shortly after the release of OS/2 2.0," Wraight said. However, OS/2 2.0 is slated to ship by year's end, and he said Lotus is still evaluating what will be moved to a 32-bit environment.

Among the improvements to 1.1 are a C programming interface, a draw layer that lets users create graphs and spreadsheets in the same window and the ability to create customized dialogue boxes within Lotus macros.

Also unwrapped last week were 2.0 and 2.1 upgrades to 1-2-3/M Version 1. Release 2.0 provides support for IBM's VM/ESA and provides Spreadsheet Connections for 1-2-3 for DOS Releases 2.3, 3.1 and 3.1+, as well as 1-2-3 for OS/2.

Release 2.1 provides Datalens Driver support for IBM's Applications Systems Customized Data Interface, Batchmode support and Spreadsheet Connections for 1-2-3 for Windows and 1-2-3 for DOS Release 2.2J.

TU Services, a subsidiary of Texas Utilities, likes the VM/ESA support, but systems analyst Ken Base said 1-2-3/M's file server support exposes his users to an unacceptable degree of data loss.

The file server's user ID provides each user with all-or-nothing access. Base could put passwords on the spreadsheet file, but the workstation delete option in Lotus does not respect the password.

"We addressed this with Lotus, but they said they had to do it this way to maintain [backward] compatibility," he said.

# Borland has Windows treats

BY CHRISTOPHER LINDQUIST
CW STAFF

NEW YORK — Borland International, Inc. last week finally announced a set of Windows products that it has been talking about for months.

At the New York Personal Computer User Group meeting, Chief Executive Officer Philippe Kahn presided over demonstrations of Windows versions of Objectvision 2.0, Paradox, Object Dbase and Quattro Pro.

Common features include Object Linking and Embedding support, common modules for such functions as graphics handling and a feature called "menus on demand," which allows users to click on any object to call up a menu of attached variables.

Other features demonstrated included the following:

**Objectvision 2.0**
- Rulers and grids.
- Dynamic Linked Libraries (.DLL) can be attached to Objectvision applications.

**Paradox for Windows**
- A visual environment.
- The ability to compile applications to executable (.EXE) or .DLL files.
- Database objects and their relationships can be displayed in a treelike format.

**Object Dbase for Windows**
- Will compile Dbase III and IV applications to .EXE or .DLL Windows applications.
- Allows the addition of Windows "widgets."

**Quattro Pro for Windows**
- Uses a "notebook" and "tabs" format to organize and locate large groups of spreadsheets.
- Includes a dialogue box builder for creating dialogues.

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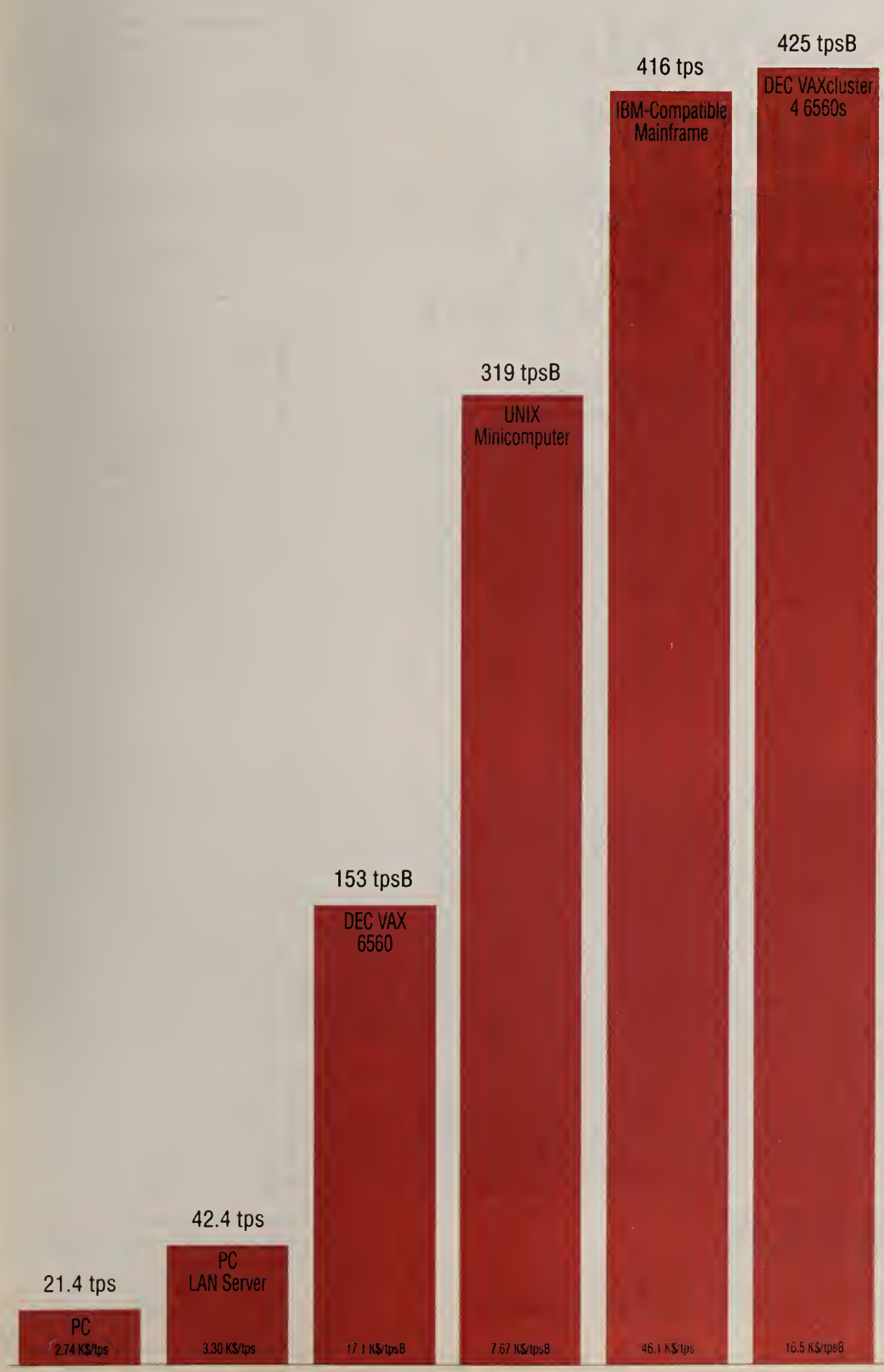


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# Bells

CONTINUED FROM PAGE 1

ban — imposed as part of the 1984 AT&T breakup — would be reversed.

The RBOCs said they will move ahead immediately into the $9 billion information services market but offered few details, saying that the terms of the AT&T divestiture had prevented them from doing the market trials that must precede firm decisions about new services.

However, several of the firms said they would begin offering "electronic Yellow Pages," multimedia protocol conversion and smart gateways into commercial information services within a year (see chart page 1).

Competing providers of information services, including newspapers and owners of some 12,000 commercial databases, strongly opposed lifting the ban. They said it prevents likely abuses resulting from the telephone companies' near monopoly over local networks.

The RBOCs have been allowed to transmit information and do offer services that provide gateways into commercial database services. However, they have been barred from originating or owning the data and from processing it.

Users expressed worries that the ban had been lifted without imposing safeguards against anticompetitive behavior by the RBOCs, which will be in the unique position of owning both the information and the circuits it moves over.

"Without safeguards, users will pay more than they should, and they will lose choices and options in the marketplace," said Brian Moir, Washington, D.C., counsel for the International Communications Association (ICA), a group of large communications users.

Responding to cries for safeguards, Rep. Jim Cooper (D-Tenn.) and four others introduced a bill last week that would stop the RBOCs dead in their tracks. The bill would require the Bells to wait until significant competition exists in local telephone markets (see story below).

As they take their first tentative steps into the services business, the RBOCs are likely to train their sights initially on residential and small-business customers because those customers are less likely to have their own networks and databases, analysts said.

Scott Ticer, operations manager at Bellsouth Corp., said the company now offers an electronic gateway into some 90 commercial services, including news wires provided by *The Atlanta Constitution*, Dow Jones & Co. and United Press International. He said the service is "horrible in terms of use" because users must contend with as many as 90 ways to access and manipulate information.

Now that Bellsouth can legally process the data, it could offer a smart front end to the 90 services, giving users a single standardized set of commands for all of them, Ticer said.

A number of RBOCs said they were already in negotiations for joint ventures with information services firms. They also said acquisitions were possible. None would give details.

"Our position has not changed. We welcome competition as long as it's fair," said Brian Ek, communications manager at Prodigy Services Co. in White Plains, N.Y. Prodigy, a videotex joint venture of IBM and Sears, Roebuck and Co., claims more than 1 million subscribers.

## Congress eyes reversal

The battle over the RBOCs' right to provide information services has moved to Capitol Hill, where legislation was introduced last week that would reverse court actions freeing the Bells from a nearly eight-year ban on owning or processing information.

In the "local bottleneck test," the bill said the RBOCs may not provide "electronic publishing services" in areas where less than 50% of the businesses and residences have access to local competing transmission and switching facilities of comparable quality, cost and functionality.

At least 10% of all those businesses and residences must actually use those alternative facilities.

The bill, introduced by Rep. Jim Cooper (D-Tenn.) and others, contains other restrictions, including the requirement that the RBOCs set up information services in subsidiaries at arm's length from their regulated telephone operations.

"About 80% of the text of the bill deals with safeguards," the ICA's Brian Moir said. "The effort to deal with safeguards is the most responsive one we've seen to date."

The RBOCs howled in protest, calling the bill blatant protectionism. "The Cooper bill would make the regional companies' entry into the information services industry subject to market tests that would have the effect of keeping us out of the business forever," said John Connarn, vice president of federal relations at Ameritech Information Technologies.

ELLIS BOOKER and
GARY H. ANTHES


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# Pricing

CONTINUED FROM PAGE 1

leader for new database applications at U.S. Surgical Corp. in Norwalk, Conn. "Users often fell into higher priced brackets just because they moved their database to a larger CPU. To see this coming about is encouraging."

Sites that devote part of a large computer to a given database application stand to benefit most from per-user pricing. "Now you can get into Sybase or Oracle for cheap money, especially if only a small group of database users are logged onto your IBM 3090 mainframe," said Michael Corey, newly elected president of the International Oracle Users Group. "As you get hooked on the product, it gets more and more expensive."

### Rising and falling

However, database experts said that prices are as likely to go up as they are to go down. Small groups of database users with large machines would see prices fall, while growing groups of end users accessing a LAN database server would see prices rise.

"The vendors claim per-user pricing is revenue-neutral," said Stuart Woodring, director of software research at Forrester Research, Inc. in Cambridge, Mass. "But it's a way to break users into a new way of thinking about prices. If the price is up to $750 a head, and you have 20 people using a network server, the total price will be $15,000," or roughly the same price as a minicomputer database license.

Oracle announced its new pricing strategy for its Unix product on Oct. 1, but test-marketed the concept for more than a year on selected Unix platforms, said Ron Wohl, vice president and assistant general manager at Oracle's Product Division. Roughly half of Oracle's license revenue is Unix-related.

Sybase made its per-user pricing policy effective Sept. 15, through customer letters [CW, Oct. 7].

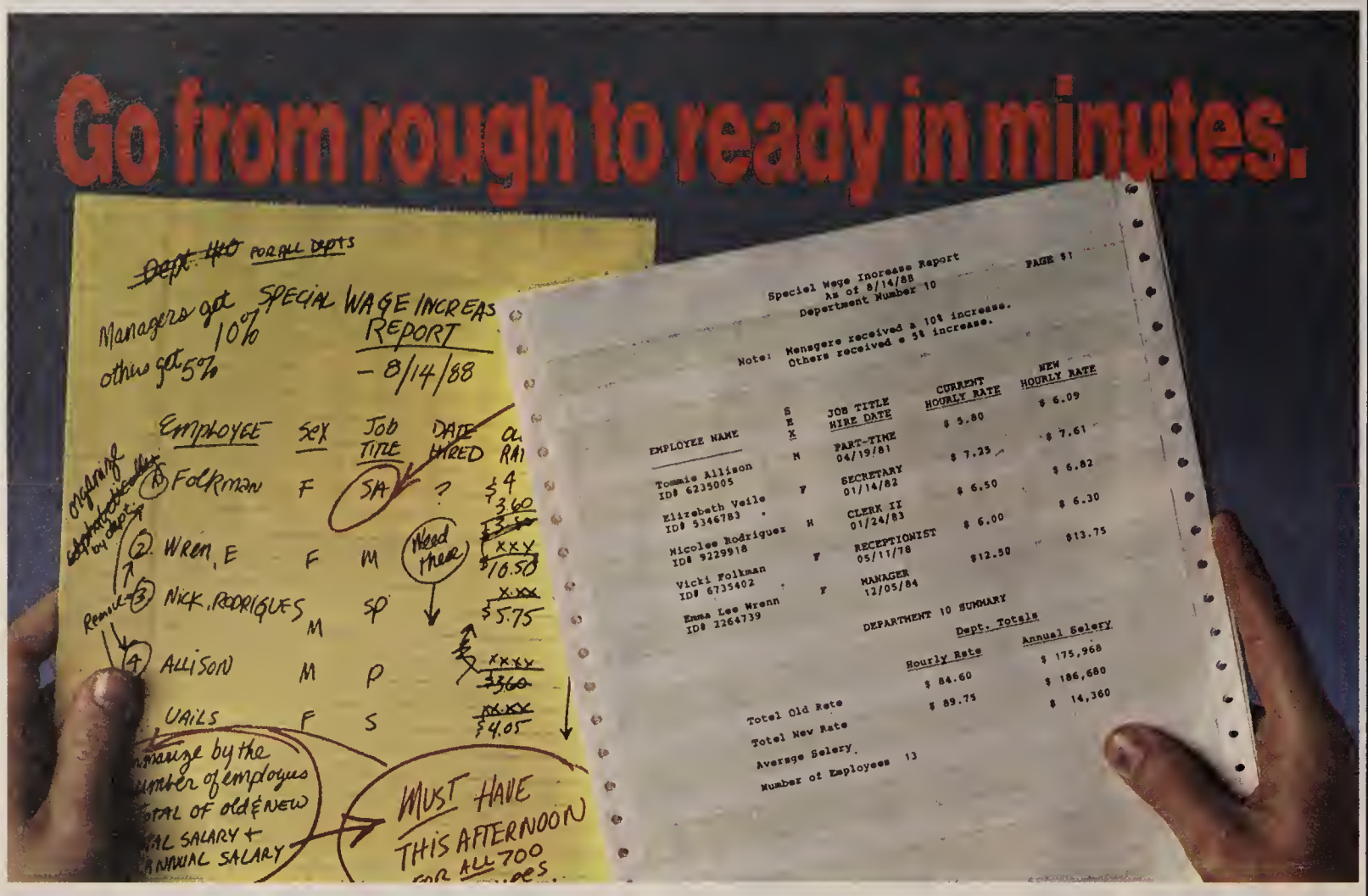
Some Sybase users are still concerned that per-user pricing could lead to higher prices for some sites. Prices for low-end Sybase SQLserver products tripled last month from $995 to $3,000, while licenses for 10 or more users of the same product doubled from $4,000 to $8,000.

However, some analysts credited much of that price jump to Microsoft Corp., which sells the Sybase SQLserver for OS/2 product to end users. Only two pricing tiers were provided, not allowing for much flexibility.

### Ready, set, bid

With a level pricing field to play on, vendors may now start a bidding war, Woodring said. "It's going to be a dogfight in the North American database server market for the next 12 months," he said. "The vendors see powerful and cheaper boxes coming down the road, and they've realized their [minicomputer] pricing model won't work for those machines."

Some vendors said they are concerned that per-user pricing will be difficult to enforce unless some kind of meter is put in place to count the number of users logged on at once. Despite their concerns, vendors are likely to be the first beneficiaries of per-user pricing, industry analysts said. "The vendors found that the older pricing schemes were getting too complex to manage," said John Morrell, a software analyst at International Data Corp. in Framingham, Mass.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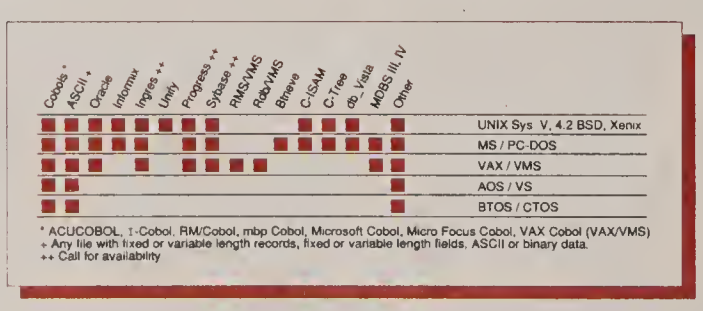


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# IBM weighs DR DOS option

BY KIM S. NASH
CW STAFF

Reports continue to swirl regarding a pending deal between IBM and Digital Research, Inc. (DRI) that would give IBM rights to distribute DRI's DR DOS operating system.

An IBM spokesman acknowledged last week that the company is "in discussion" with DRI but has signed no agreement pertaining to DR DOS. However, Richard Dixon, DRI's Asia Pacific vice president, told *Computerworld Hong Kong* it is "reasonable to assume that IBM would not be spending this much time looking at DR DOS if [it was] not going to license it."

Meanwhile, IBM may be able to get access to DR DOS through its marketing agreement with Novell, Inc. DRI agreed in July to be acquired by Novell for $80 million [CW, July 22].

The IBM/Novell deal allows IBM to promote and sell Novell equipment. Dixon told *Computerworld Hong Kong* that IBM will get marketing rights for DRI products when Novell completes its takeover of the company, expected this month. DRI Chief Executive Officer Dick Williams was unavailable for comment.

At least one DR DOS user welcomed the possibility of IBM selling the operating system. Baltimore-based Martin Marietta Aero & Naval Systems, a division of Martin Marietta Corp., plans to set up a 1,000-node Novell Netware network within six months.

With IBM Personal System/2s making up the majority of the nodes, the ability to download a single version of DR DOS from the file server to all the nodes would erase a lot of application compatibility headaches the company currently has, according to Ron Kosar, enterprise network manager. "This agreement would make us a unified shop. I'm all for it," he said.

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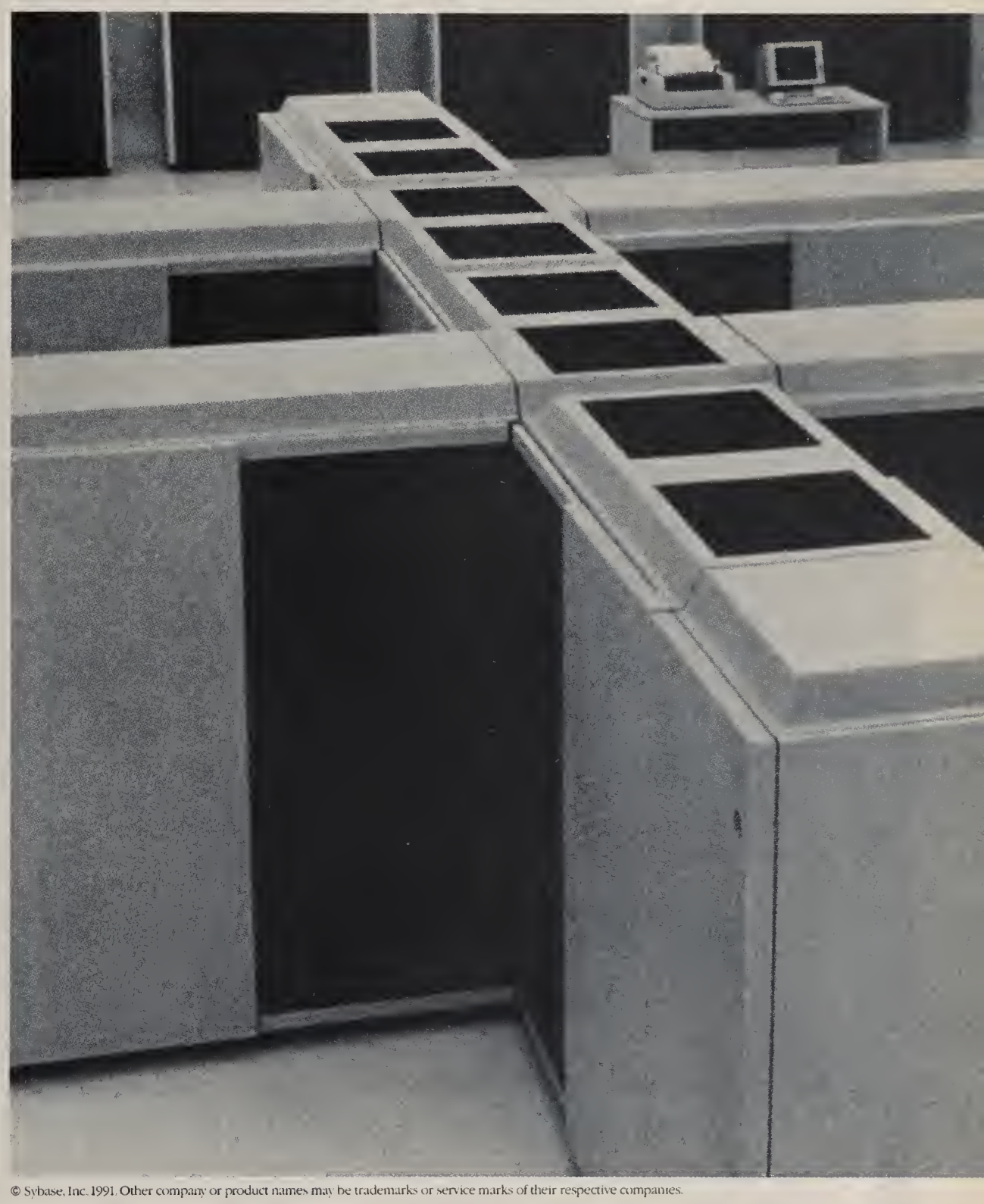

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# Supreme Court refuses Morris appeal

BY MICHAEL ALEXANDER
CW STAFF

WASHINGTON, D.C. — The U.S. Supreme Court refused without comment to hear Robert T. Morris' appeal last week, ending a legal journey that began nearly three years ago when he injected a worm into the Internet network.

While the trek is over for Morris, there remain serious questions about the Computer Fraud and Abuse Act of 1986, the statute under which he was prosecuted, according to several legal experts.

The refusal to review the Morris case leaves intact a "bone breaker" law that could transform otherwise law-abiding computer users into felons and inhibit the creative uses of computer technology, according to Thomas Viles, an attorney at the Silverglate & Good law firm in Boston. Viles authored a friend of the court brief in the Morris appeal on behalf of the Electronic Frontier Foundation.

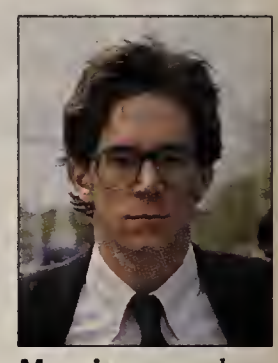
Some legal experts worry that computer users who enter a computer system without authorization, either unwittingly or with the intention of merely looking around, could be given penalties that are overly severe.

"A simple computer entry is of an entirely different order than the destruction of data or the intentional alteration of data, just as a simple trespass is pretty minor stuff compared to vandalism or burglary," Viles said. "Now if people whose livelihoods depend on computers get into somebody else's computer without authority, they could be in Leavenworth for five years."

The Morris appeal boiled down to the critical question of whether he intended to cause the harm that ensued after he set loose his ill-conceived computer program on Nov. 2, 1988.

Last year, a federal judge in Syracuse, N.Y., ruled that it was not necessary for the government to prove that Morris intended to cause harm, only that Morris intended to access computers without authorization or to exceed authorization that he may have had. Earlier this year a federal appeals court upheld Morris' May 1990 conviction under which he received three years probation, a $10,000 fine and 400 hours of community service.

That affirmation goes against the widely accepted tenet that an injury can amount to a crime only when deliberately intended, Viles said. "The law distinguishes, say, between murder and manslaughter. You can't be guilty of murder if a killing was utterly accidental and unintended."



**Morris** *argued on the issue of intent to cause harm*

A General Accounting Office report released in 1989 noted other flaws in the federal computer statute. While the law makes it a felony to access a computer without authorization, the law does not define what is meant by "access" or "authorization," the GAO reported.

### Updating the law

U.S. Department of Justice officials recently acknowledged that the Computer Fraud and Abuse Act is outdated and noted that it should be refined [CW, Oct. 7]. Scott Charney, chief of the Justice Department's newly created computer crime unit, said the department will lobby to fortify the law with provisions that would outlaw releasing viruses and worms and make it a felony to access a computer without authorization and cause damage through reckless behavior.

Trespassing into a computer is more serious than it may appear at first glance, Charney said. "It is not easy to determine what happened, whether there was damage, how safe the system now is or what the intruder's motives were."

Some legal experts said they believe the law is already overly broad and do not advocate expanding it with new provisions. "It is a far-reaching law whose boundaries are still not known," said Mark Rotenberg, an attorney and director of the Washington, D.C., office of Computer Professionals for Social Responsibility. "The way I read the law is, the Justice Department has everything it needs and more," he said. "After the Morris decision, if you sneeze, you could be indicted."

The Morris case pointed out deficiencies in the law that have resulted from technology's rapid advance, said Thomas Guidoboni, the Washington, D.C.-based attorney who defended Morris.

Neither Guidoboni nor Morris were surprised by the Supreme Court's refusal to hear his appeal, according to Guidoboni. "Robert's case had a particular problem in that it was the first one [involving the 1986 act]. They like to take cases after the circuit courts have had some chance to play with them and see if there is a disagreement."

Morris is working as a computer programmer in Cambridge, Mass., for a company that "knows who he is and what he's done," Guidoboni said. He declined to identify the company.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# Projecting the true cost of your lease agreement

*With the number of times large computers and other high-tech assets are upgraded during the lease term, it's impossible to know the actual cost of a lease until its termination. That's why it's critical that the terms and conditions of your lease don't restrict your options when it comes time to upgrade or replace equipment.*

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The right lease language can open up your options and increase your savings when it comes time to upgrade.

How much can you save? **See Figures 1 and 2.**

**FIGURE 1** Equipment leased: IBM 9121-260 64/12[1]
List price: $1,125,600 Lease term: Five years

| Year | Upgrade | New from Manufacturer[2] | Comdisco Reconditioned Alternative | Plug-Compatible Alternative |
|---|---|---|---|---|
| 1 | 64-128 M8 memory | $ 134,400 | $ 110,000 | $ 80,600 |
| 2 | 128-256 MB memory | 268,800 | 201,600 | 134,400 |
| 3 | 256-512 M8 memory | 537,600 | 320,000 | 268,800 |
| 4 | Model 260 to Model 440 upgrade | 980,600 | 700,000 | 700,000[3] |
| 5 | 512-1024 M8 memory | 1,075,200 | 400,000 | 322,560 |
| Total Upgrade Costs | | $2,996,600 | $1,731,600 | $1,506,360 |
| Total Potential Savings | | — | $1,265,000 | $1,490,240 |

1 Prices used are based on market conditions on or about 9/20/91 and are for comparative purposes only.

2 Based on IBM list price.

3 For purposes of comparison only; plug-compatible manufacturers do not provide model upgrades.

*The right terms and conditions allow you to seek the best value when it comes time to upgrade. Access to new, used and third-party alternatives from independent leasing companies could save you millions.*

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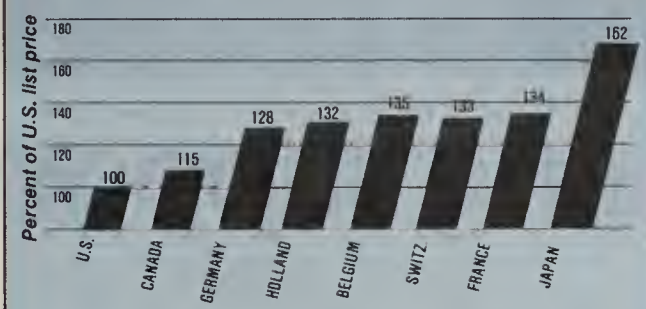
**FIGURE 2** Average price comparison of large IBM systems around the world.*




Source: Comdisco Inc.
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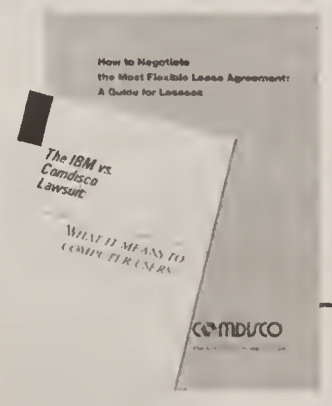


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# IBM gears PS/1 prices for low-budget buyers

BY MICHAEL FITZGERALD
CW STAFF

WHITE PLAINS, N.Y. — IBM last week announced two aggressively priced versions of its Personal System/1 and said it would bundle its next release of OS/2 with the boxes next spring.

Despite the OS/2 2.0 add-in, IBM said it expects to see the new PS/1s sell primarily into the small business, home office and education markets. The systems are available immediately.

The PS/1 comes in only two configurations. Both models are based on Intel Corp.'s 80386SX chip running at 16 MHz and will have 2M bytes of random-access memory and a 12-in. IBM Video Graphics Array display. IBM will bundle Microsoft Corp.'s DOS Version 4.01 and Works packages, as well as access to the Prodigy information service.

"When we showed the PS/1 to [customers], they told us they were looking for something that has [less specific] configurations," said Tony Santelli, IBM's vice president of new business development for the Entry Systems Division.

The $2,199 PS/1 386SX B82 will have an 80M-byte hard drive and two AT-bus expansion slots. The $1,699 PS/1 386SX C42 will have a 40M-byte hard drive. Both will support IBM's optional PS/1 compact disc/read-only memory drive.

Options include 80M- and 129M-byte hard drives.

Analysts said they were impressed with IBM's pricing. "They're very competitively priced against their primary competition," said Richard Zwetchkenbaum, senior hardware analyst at International Data Corp. in Framingham, Mass.

Chief among IBM's entry-level PC competitors are Packard Bell, Inc. and Tandy Corp., he noted.

IBM will continue to sell the existing Intel 80286-based PS/1 Models C34 and M34.


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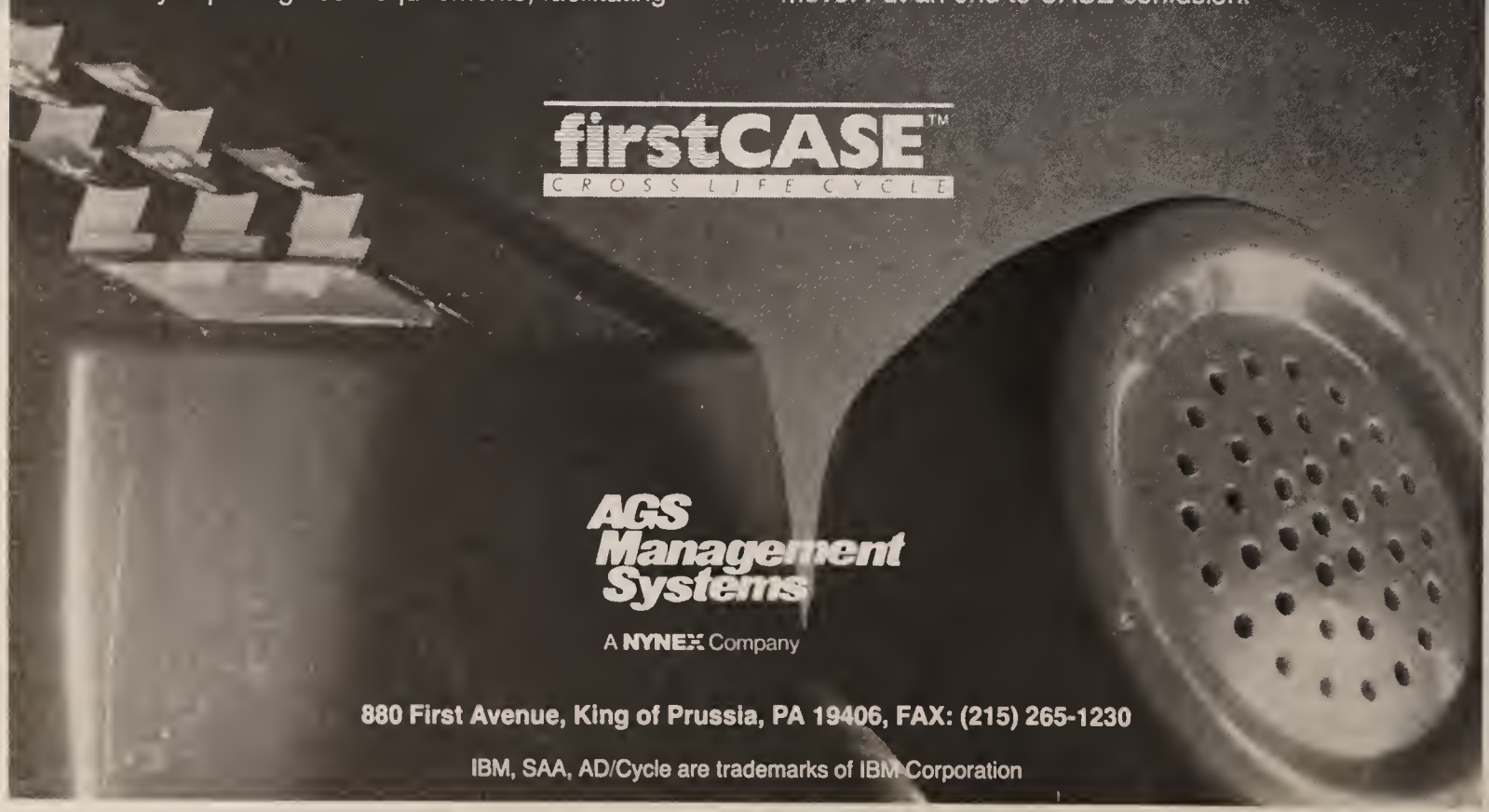



# PC makers in Taiwan slow price cutting

BY CHRIS BROWN
IDG NEWS SERVICE

TAIPEI, Taiwan — Notebook computer prices, which have plunged more than 40% this year, are beginning to stabilize as many smaller firms exit the market, according to Taiwanese personal computer exporters.

Sourcing agents still estimate that there are up to 50 Taiwanese companies offering notebook PCs, but the vast majority are small outfits. Firms now producing more than 1,000 units a month probably number less than 10.

Current prices on an 80386SX-based notebook with a 40M-byte hard disk can go as low as $1,200 for bulk orders. Earlier this year, Taiwanese PC makers were quoting prices in the $1,600-to-$1,800 range for 80386SX machines with 20M-byte drives.

### A disappearing act

Observers said the disappearance of many smaller firms from the local market should slow the rampant price cutting. Six months ago, many Taiwanese firms were announcing notebook PCs and offering rock-bottom prices, but only a few could deliver in quantity.

"The market competition has gone back to normal again. The price war is not so bad," said Eddie Chao, marketing manager at Twinhead International Corp.

Among the top Taiwanese companies now producing notebook PCs are several firms that specialize in contract manufacturing. In this camp are Compal Electronics, Inc. and Quanta Computer, Inc. Other PC makers with significant output of notebooks include Twinhead, Mitax International Corp., Chicony Electronics Co. and Acer, Inc.

The government-backed Market Intelligence Center (MIC) predicted notebook PCs will remain a high-growth product for Taiwanese companies this year. In the first six months of this year, MIC estimated, Taiwan shipped 170,000 notebook and laptop computers. This figure accounts for 14.4% of Taiwan's total PC shipments and 20% of the country's PC output value.

Overall, MIC reported, Taiwan shipped 1.176 million PCs from January through June worth $822 million.

A major factor slimming the ranks of notebook producers has been the failure of Taiwan's Notebook PC Alliance, which grouped together 47 firms and government-backed researchers.

The alliance completed work on a prototype late last year, but only a few of the 47 firms ever went on to mass production. A second notebook alliance was recently canceled.

But Taiwan's alliance craze is not yet over. The Computers & Communications Laboratory (CCL), which led the first notebook alliance, has rounded up 15 firms to take part in designing a handheld PC and maybe a pen-based system. Prototypes of both products should be completed by the end of the year, according to the CCL.

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# ADVANCED TECHNOLOGY

TECH TALK

### Short but super tape

■ Scientists at the Argonne National Laboratory in Argonne, Ill., and Superconducting Products Co. in St. Charles, Ill., have invented a superconducting tape. The tape, made from a single filament wire and then flattened, was a few inches long and was cooled with liquid helium to about minus 452 degrees Fahrenheit. High-temperature superconductors are recently discovered materials that lose all resistance to electrical current when cooled by liquid nitrogen. Researchers around the world have been working to develop practical wire out of these materials.

### Hands-off approach

■ Don Millard and Robert Block, researchers at Rensselaer Polytechnic Institute in Troy, N.Y., have devised a technique to test printed wiring boards without touching them. Boards are typically tested by touching contact points with metal pins to complete a circuit, but this sort of testing is becoming increasingly difficult as boards become smaller and more complex. The researchers' method is based on focusing a pulsed laser beam on a foil of tungsten or other plasma-forming substance. A plasma is an extremely hot, highly conductive ionized gas.

### Fuzzy plan with a purpose

■ Omron Corp. and NEC Corp. have agreed to cooperate in the development of fuzzy-logic or inference microchips. The agreement calls for the two companies to merge Omron's fuzzy-inference technology with NEC's semiconductors to create both fuzzy-inference development support systems and microprocessors that can execute fuzzy inferences. The two companies will market the fuzzy-logic development support systems and microprocessors that result from the pact. The planned products will allow fuzzy systems to operate faster than is now possible, according to the companies.

# Storage coming in small packages

*A California professor has patented an optical storage device the size of a sugar cube*

BY CLINTON WILDER
CW STAFF

It may not be an exaggeration to say that Prof. Peter Rentzepis carries the future of data storage technology in his shirt pocket.

Rentzepis, a chemistry professor at the University of California at Irvine, has developed and patented a data storage device the size of a sugar cube that is capable of storing as much as 6.5 terabytes. Rentzepis is one of several researchers across the country exploring three-dimensional optical storage media.

Although commercial applications could be many years away, the potential for orders-of-magnitude improvements in storage media size, speed and price is quite staggering. "I'm very optimistic," Rentzepis said.

A working prototype of the technology may be ready within the decade, he added.

A native of Greece, Rentzepis has spent most of his career, including 21 years at AT&T Bell Laboratories, researching the interactions between lasers and materials. The storage cube is one of 52 patents that he holds. In his invention, a laser beam is split into two beams, which are aimed at the cube at right angles. The data is stored at the point where the two laser beams, also known as photons, meet.

Through extensive research, Rentzepis discovered that the cube — made of commercial polystyrene plastic treated with organic chemicals — reacted to the laser light in ways ideal for storing binary data. The chemical molecule changes composition and color depending on whether the laser beam emits a 1 or a 0 data bit. Thus, in a matter of nanoseconds, the cube becomes encoded with the data, which can be read by a laser beam of another color.

The cube can be erased selectively with infrared radiation or entirely by applying heat.

Perhaps one of the biggest technical barriers to commercial application of the technology is a challenge similar to that superconductor technology pioneers: The cube needs to stay at very low temperatures for the molecules to retain their coding. At room temperature, the "opened" molecule will close.

Another barrier is the size of the machines necessary to produce the lasers. The state of the art is a 1-ft by 1-ft device developed at Microelectronics and Computer Technology Corp. (MCC) in Austin, Texas, which might be practical in a supercomputer but not in anything much smaller.

Although virtually any storage application could be improved by three-dimensional optical technology, Rentzepis said, the greatest potential for its benefits lies in massively parallel computing. The storage cube "is very inexpensive and very fast," he said. "A disk is very hard to work in parallel." In addition, the cube has no moving parts, giving it a potential reliability advantage over even the most advanced disk drives.

Rentzepis said he has received much interest in 3-D laser storage technology from computer vendors and fellow researchers around the world. Despite the interest, Rentzepis said he feels that the computer industry may not be ready to implement the technology for some time.

"Besides the technology difficulties, the obstacle is the big quantum step that the industry must take to apply this," he said.

Alan Levenson

**Prof. Peter Rentzepis** *displays his contribution to optical storage media, a small cube capable of storing as much as 6.5 terabytes of data*

# Simulators offer glimpse into human body

BY CAROL HILDEBRAND
CW STAFF

Technology is edging a little closer to humanity with the announcement of two computer simulators that will help medical researchers fathom the workings of the human body.

Researchers at Los Alamos National Laboratory in New Mexico have come up with Neurobuilder, a set of software tools that helps mimic a variety of brain functions, and an improved computer simulation of the immune system.

The first project is the brainchild of Bryan Travis, a scientist at the laboratory's Earth and Environmental Sciences Division. Travis, whose background is in applied mathematics, parlayed his secondary interest in biology into Neurobuilder.

The system, which runs on a workstation from Sun Microsystems, Inc., uses a homegrown windowing system to let a user build a picture of a network of neurons, which are the messengers through which the brain sends its signals. The system can handle anything from a picture of a single neuron to a many-layered network of thousands of cells, Travis said.

Neurobuilder could be of vital use for medical researchers, he said. For example, a user could use the system to recreate a damaged auditory system. "You could then see how it affects the model," he said, and apply the conclusions toward alleviating real health problems such as deafness.

The second simulator out of Los Alamos comes from the Theoretical Biology and Biophysics group. Scientist Alan Perelson has used a concept known as multiple time scales to help researchers comprehend the complexities of the human immune system.

Through the system, users can gain new comprehension of diseases that strike the immune system, such as acquired immune deficiency syndrome.

Multiple time scales are used to simulate cellular and molecular interactions occurring at varying speeds.

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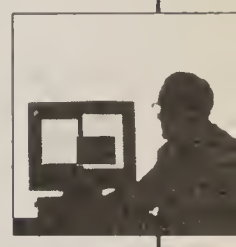


When an office doesn't work, it's a people issue, right?
When productivity falls, it's a people problem, right?
Well, let's see how wise that bit of conventional wisdom is.

As a nation, for the past 15 years we've been throwing people at the problem of office productivity.

Of the more than 116,000,000 Americans who are working today, almost 58% of them are white-collar office workers.

# OFFICES THAT WORK.

And since 1976, the number of people who work in offices has grown twice as fast as other segments of the workforce.

So has it worked? Have more people meant more productivity?

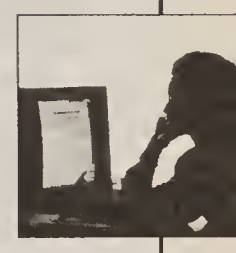
Since 1976, the U.S. has trailed virtually all industrialized countries in productivity growth.

White collar productivity rose less than 1% per year during the 1980s.

And in 1989 and 1990, it actually declined.

Clearly, throwing more people, or different people, at the problem doesn't solve it.

But something else does. Something unconventional.



There are dozens upon dozens of enterprises—companies, government agencies and universities—which have made dramatic gains with essentially the same people working in their offices and departments.

In the credit card division of a major financial institution, customer service response time was slashed from as long as four days to just minutes.

In the accounts payable department of a leading consumer products company, the time it took to file in-coming checks, invoices and requisitions went from a two-to-three-month backlog to instantaneous filing the moment they arrive.

And, the corporate legal department of an aerospace firm realized a 60% reduction in trial preparation costs.

So what changed? What made these offices work, when so many don't?

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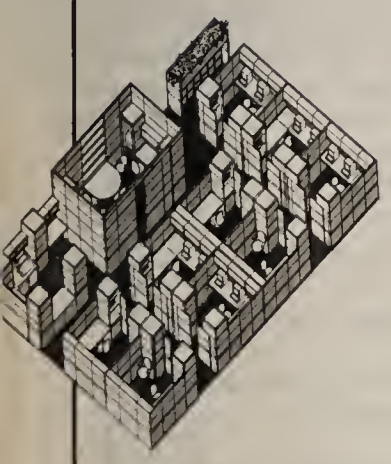

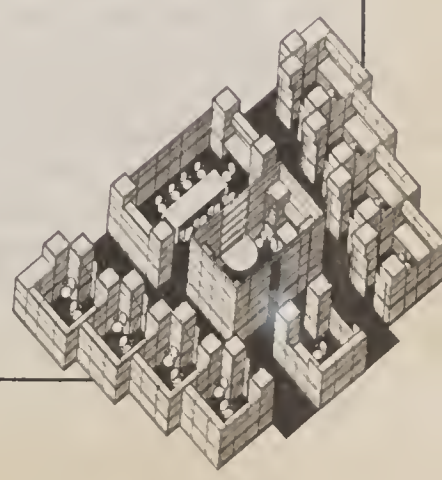

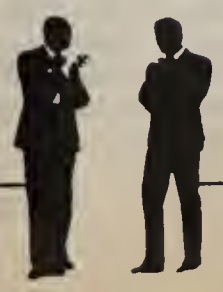

WANG

## EDITORIAL

# Child's play

It isn't every day that a couple of Italian plumbers make headline news in the information systems business.

But that's just what has been happening lately — and with enough frequency to raise some eyebrows. The plumbers, of course, are the Mario Brothers, who for several years now have been the most common icon in the pervasive Nintendo video game world.

So what do these game characters have to do with the price of eggs in the IS world? A few months back, *Computerworld* ran a front page piece about a joint effort of Tandem Computers, Nintendo and Japan's Namura Securities, which created a system allowing consumers to buy, sell and swap all sorts of securities and financial instruments using the Mario Brothers "interface." What started out as an experiment to rope in 5,000 households mushroomed beyond the troika's wildest expectations, with close to 200,000 households signed up for home stock trading within a year.

Two weeks ago, Control Data and Nintendo hooked up on a pilot project to allow Minneapolis residents to purchase lottery tickets from the comfort of their living rooms.

And last week, Nintendo said it has hooked up with Mitsubishi in a project that will allow consumers to bet on horse racing by using their Nintendo control pads. "Real sophisticated stuff," you say, sarcastically.

You're darned right it is. These applications are the height of sophistication because they are the height of simplicity. The programming that went on behind the scenes is ingenious. Finally, someone has brought to mainstream business applications the ease of use of the telephone and the fun of, well, a computer game that a 6-year-old can manage.

Consider the business requirements of these systems. Namura needed a way to tap the investment potential of small investors. You can't do that with high-cost brokers fueled by high commissions. The Nintendo alliance removes the middle person, driving transaction costs through the floor.

In Minneapolis, the lottery people anticipate increased ticket sales and lowered sales costs. And in Japan, race tracks foresee an uptick in betting as sports fans place their bets via a simple television transaction.

These are not the first truly user-friendly systems built. Banks' automated teller machines (ATM) are easy to use. But how many applications have been built into ATMs that actually allow the banks to do more business and optiinize their systems investments?

Throughout 1991, the leading issue in IS management has been cost containment. In 1992, the ability to link information technology investments directly and definitively to productivity increases will emerge as the key IS issue. As the TV-based Nintendo applications show, no system will succeed in addressing this issue like one that can reduce the user interface to child's play.

## LETTERS TO THE EDITOR

### D.C. not alone

Your article "D.C. pros face up-Hill battle" [CW, Sept. 16] was an informative and generally accurate summary of conditions in our area. However, I was struck by your list of "Largest employers in the private sector."

It illustrates that your article seemed to be focused on the 10-sq-mile area comprising the District of Columbia, rather than the metropolitan area, which includes five times the population of Washington, D.C., proper.

The federal government is still the largest presence in our area, but the private sector has assumed a position thought to be equal to the feds over the last 10 years.

The bottom line is still that things are tough all over.

*Peter L. Kleberg*
*Infodata Systems, Inc.*
*Falls Church, Va.*

### Artistry counts

Robert Gifford's article "CASE culture shock" [CW, Sept. 16] presents a logical argument for a scientific/engineering approach to computer-aided software engineering (CASE) and software development, except for an apparent misunderstanding of an artist's qualities and habits.

Artists are not undisciplined slaves to creative impulses. They work within constraints and deadlines.

Artists continually question and test these constraints so that they and their area of expertise may grow.

Artists strive for perfection based on the requirements of the product they are working on.

Artists take a personal interest in every aspect of the product development.

The scientific/engineering types, on the other hand, tend to divorce themselves from the day-to-day implementation activities and concentrate on the more interesting analysis and specification activities.

While still respecting the author's conclusions, I submit that program development needs fewer scientific/engineering types and more artist types. Further, if CASE cannot support the artist, then we might well question CASE as an approach to program product development.

*Francis K. Walnut*
*Documentation Research*
*Drexel Hill, Pa.*

### Need more tests

Lee Gruenfeld's article "No software guarantees" [CW, Sept. 30] amounts to the observation that even when software can be proven to be a correct implementation of a formal specification, that specification cannot be shown to express the "true" ideal of the user's requirements.

This is true, but it is hardly germane; in reality, there are very few software products that get anywhere near being provably correct.

The article suggests that more or better tests could render formal proofs irrelevant.

Actually, testing is in no way an alternative. For a test to fully demonstrate the correctness of a program, it must be at least the equivalent of the actual use of that program throughout its lifetime.

I'm not suggesting that formal proofs are an alternative to testing, but I suspect that their use would lead to a considerable improvement in software quality before the "Godel barrier" becomes a limiting factor.

*Andrew J. Raybould*
*Jersey City, N.J.*

### Licensing woes

I am troubled by the number of letters in support of the New Jersey licensing proposal for information systems professionals. I question whether proponents of this bill are really concerned about consumers of data processing services.

These consumers already have three means for selecting qualified IS vendors: references, references and references.

The issue is not competence but suppressing competition. Aside from collecting fees, a governmental body such as the one proposed in New Jersey would only serve as a barrier to entrepreneurship. Small firms would commit an inordinate amount of their resources to meeting the arbitrary standards such a board would impose.

If there is a problem with IS personnel services, it is with a small number of large vendors who have mastered the art of selling to corporate decision makers and then providing the minimum service.

*Jack Fox*
*Obelisk Applications Corp.*
*Oakley, Calif.*

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Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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# Computers don't bumble or flee

HARVEY NEWQUIST III

Today, most people presume that almost everything is automated. Two recent events — the power outage that crippled AT&T's phone lines and service several weeks ago and last month's Manhattan subway crash — pointed out both how wrong that assumption is and how much better off we'd probably be if it were correct.

Hundreds of thousands of people were affected by AT&T's incapacitation. The frustration felt by those who were inconvenienced was aggravated after the fact, first by the revelation that the shutdown was caused by human error and then by the admission that system alarms were sounded and ignored by AT&T personnel.

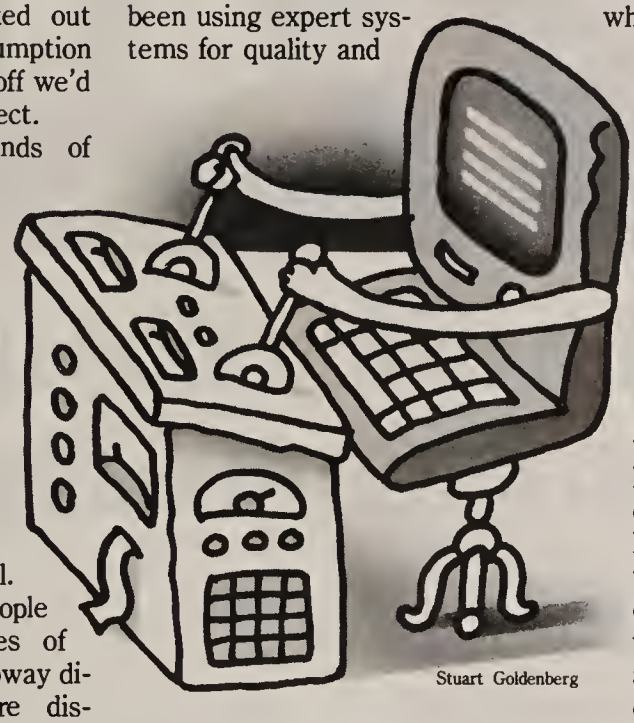
Separately, those people injured and the families of those who died in the subway disaster were even more disturbed to hear that the driver of the train had been "under the influence" and had actually run away from the scene of the carnage he caused.

### Human nature

You can't blame people for acting human. In cases of stress and shock (or intoxication) the brain's first impulses are directed toward self-preservation. Emotions run wild, and fear becomes a factor in decision-making. On the other hand, computers are not capable of fear (at least not yet) and therefore can rely on their original programmed rules and instructions in circumstances that would send most people scurrying to the nearest emergency exit.

If computers had been running the operations involved in both these accidents, the outcomes would surely have been different. An expert system would not have disregarded the AT&T alarm. It would have either switched back to the generator from battery power or resolved any conflict in signals.

Many companies have been using expert systems for quality and process control for years, and their manufacturing operations are a lot safer as a result.



Stuart Goldenberg

Campbell Soup Co., for example, has a knowledge system in place that shuts down the manufacturing of soup if there is an aberration in the cooking process. The system responds in minutes with clear-cut instructions about how systems errors should be handled and how the food in process should be dealt with. Since the expert system is programmed to make its judgements based on some very defined rules, including both federal regulations and Campbell's own quality control stipulations, it is never in a quandary as to how to handle any given malfunction. And it certainly has no lines of code that tell it to ignore any alarms or warnings.

Moving back to the issue of controlling transportation, the city of Paris has a computerized system that combines visual recognition with a knowledge base to control the flow of traffic through certain intersections. The system uses video cameras as sensors for the expert system, which then makes decisions about how to adjust traffic signals and provide for safer pedestrian conditions.

That system was built using a real-time expert system, which is also being employed in monitoring life support functions for the Biosphere II, the experimental glass-enclosed structure that will serve as home and ecosystem laboratory for eight human inhabitants over the next two years. The developers of the Biosphere II felt it was more efficient to have an expert system checking on life support systems 24 hours a day, 60 minutes an hour, every day of the week, than to rely on humans who might get fatigued or miss a small aberration in the systems.

Expert systems and intelligent machines are already on the job ensuring the efficiency and quality of many of the products and services we purchase. Perhaps it is time that we extended their use into other areas, particularly operations that involve life and death safety issues and that rely soley on the attentiveness of human beings.

---

Newquist is chief executive officer of the Relayer Group, which publishes "AI Trends" and the "Multimedia and Text Report."

# Time to think about growing the market

TONY SETON

What's a four-letter word that ends in "k" and is associated with adventure and excitement? Clue: It's a word rarely heard in polite society these days, a word many people shirk like the plague.

The word is risk. Risk. You know, taking a chance, pushing the envelope, going for the brass ring. What is terrifying about risk is that it means journeying away from the familiar confines of stability and reaching out for something greater.

Risk in the computer industry means shifting from the technological development side to marketing. While R&D will continue to be a major cost center for new designs and upgrades, computer manufacturers should concentrate on convincing more people that computers are a cost-effective means of improving their lives.

Certainly there is room for technical improvement, both in tweaking current systems and in pioneering faster and safer methods of information assimilation, manipulation and dissemination. But the risk taker in the computer industry is going to look to the future and see the myriad uninitiated who would buy computers if they understood the time/effort value of the machines.

The risk, in this case, is not to drop R&D, but to eschew the pack mentality and try something new. Lower the profit margin and sell more units.

You may observe that profit margins are being shaved already, but it is not being done in a way that will actually increase the size of the market.

When you realize that a simple notebook computer could be sold for under $1,000 and then you take a look at the education market, you see potential in capital letters.

Exercising some collective foresight and taking a small risk, the computer giants could form a joint venture to design and produce a unit that could handle all the basic computing functions a student would ever need, probably for under $500. And, by familiarizing more people with computers sooner, this benevolent gesture would pay handsome dividends in the long run.

With children, the opportunity to win adherents is vastly simplified. For the untainted young, computers open side doors to that inextricably entwined McLuhanesque partnership of education and entertainment.

Computers can customize the educational process to each child, assuring that the smartest students won't be bored and that those who need more time will not be left in confusion.

Computers are not the only solution to the educational crisis, but they are proven tools for greater learning and more efficient schools. When students are able to learn from a feedback device that is never impatient with them for part of the day, and by interacting with teachers and other children for the other part, the result is a brighter, healthier and more computer-literate society. And that, of course, ultimately means a much larger market for computer systems.

---

Seton works for a manufacturer of laptop and notebook computers in Lombard, Ill.

# The leasing mess: Some blame for all

*Customers must take some responsibility for reading the fine print*

THOMAS J. DONOVAN

What is going on in the leasing industry these days? A legal argument between two companies? A multimedia marketing campaign? Or a long-running soap opera?

Since IBM and IBM Credit decided to sue Comdisco, there have been press releases, videos and white papers from both sides and public statements from interested industry groups.

With all of this sound and fury, it is easy to lose sight of what's really at issue. The lawsuit alleges that Comdisco violated IBM Credit's ownership and economic rights in a leased processor, obtaining an IBM Credit processor from an IBM Credit customer and then subleasing or selling parts to other users. Comdisco contends that its activities are standard industry practices, and IBM Credit will be compensated according to the terms in its lease contract with the original lessee.

Who is right? Everyone and no one. Ultimately, it will probably come down to a split decision, with all parties, including the end users, bearing some share of blame.

IBM Credit, as the owner, has the right to place any restrictions it wants, even what others may deem to be unreasonable, on assets it leases to end users. The users and their agents (leasing companies) must comply with all rules contained in the lease. Even though the user has the right to purchase at the end of the term, a prior sale of equipment is a violation of the lease.

### No backtracking

IBM Credit's position on subleasing — that a user cannot sublease its assets to another lessor — is unreasonable, however. If IBM Credit wanted such a restriction, it should have included it in its lease, not in some explanatory document given to the user at a later time.

Does this mean that the end users are the innocent bystanders in this leasing industry squabble? Certainly not.

Users continually create problems for themselves. They enter into lease contracts for terms that are much longer than the usefulness of the equipment. They don't read the contract, they don't understand upgrade and sublease provisions, and they treat the asset as if it were theirs. Then they create more problems, creating multiple ownership interests in one asset by financing complex upgrades with another party.

One must accept the premise that there is a trade-off between price and flexibility. If users want ultimate flexibility, let them rent on a month-to-month basis. If they want low cost, they should be willing to commit to a long-term lease. If IBM Credit rules are more restrictive than Comdisco's, users must make a reasoned choice.

Lessors must give, and users must insist on, a clear explanation of rights and responsibilities under various lease scenarios. If the lessor wants a very restrictive lease in exchange for low rent, so be it. The owner/lessor has protectable rights in its equipment. However, lessors that insist their document is fair and flexible cannot present their own self-serving interpretation of contract language at upgrade time.

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Donovan is a director at Technology Investment Strategies Corp., a research and consulting firm in Framingham, Mass.

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COMMENTARY

*Jean S. Bozman*

# The many hats of Unix

The Unix server is growing up. Once the anchor for scientific workstations alone, it is taking on new roles, including that of database server for personal computer local-area networks, repository for corporate data and substitute for the old, proprietary minicomputer.

Users say Unix is proving to be more of an industrial-strength operating system for their PC LANs than is IBM's OS/2. One Unix machine can play many roles: file server, database server, network node and central processing unit. Its multitasking abilities far outstrip that of OS/2, users at many large sites report, boosting Unix's image among IS managers.

Dave Alessandro, manager of technical services at Textron Financial Corp. in Providence, R.I., is running a LAN with PCs from a single Sun Microsystems Sparcstation II. But the rest of the system is IBM-compatible: All the workstations on the LAN are IBM-compatible PCs running OS/2 and Presentation Manager. And the end-user applications route their database queries through the Unix server to reach a corporate IBM 3090 mainframe in far-

*Continued on page 32*

# Andersen aims to blend process tasks

BY ELLIS BOOKER
CW STAFF

CHICAGO — Building an automobile or a widget is not at all like making 500 gallons of tomato soup.

Addressing this difference, Chicago-based Andersen Consulting recently announced Process/1, a software package aimed at the needs of process manufacturers such as food, chemical and drug companies.

"Process manufacturers use simple formulas, and unlike discrete manufacturers, their materials are not items so much as a set of performance characteristics," said John Menyes, vice president of information technology at The B. F. Goodrich Co.'s Geon Vinyl Division (GVD).

The plastics division, with $1.5 billion in sales, is taking the first release of Process/1 and deploying it at its plant in Avon Lake, Ohio. It plans to roll out the Andersen system to all its plants by the end of next year.

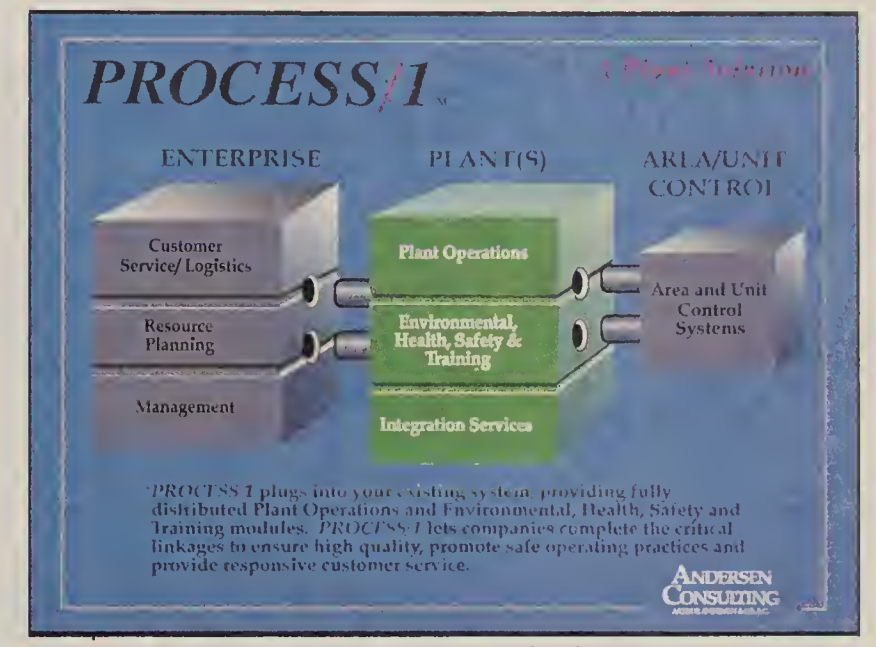
Until now, the plastics division has been using a "patchwork quilt" of applications and hardware platforms to manage its plants. The base host technology was a 25-year-old IBM mainframe financial system.

A key benefit Goodrich hopes to realize with the software is better control of its materials and inventory.

"We're expecting up to 50% reductions in raw material inventories, as well as increases in quality and responsiveness to customers," said Bruce Gordon, director of advanced systems operations at Goodrich-GVD.

Another feature touted by Andersen is Process/1's environmental health, safety and training module. The module applies current environmental safety rules and regulations to the management of raw materi-

*Continued on page 33*




**Andersen Consulting's Process/1** *is directed at process manufacturers such as food, chemical and drug companies*

# High-end DEC printer gets low marks on poll

BY MARYFRAN JOHNSON
CW STAFF

An independent survey of 1,800 Digital Equipment Corp. printers revealed recurring problems with the reliability of DEC's $49,000 high-end LPS40 laser printer.

Reliability Ratings, Inc. in Needham, Mass., reported in its September newsletter that the LPS40 has an annual failure rate of nearly 180%, more than double the average for all DEC printers. That means 100 of the printers can be expected to fail nearly 180 times in a 12-month period.

Of the dozen different DEC printers included in the survey, only the LPS40 scored badly with users. That printer, introduced in 1986, now sells on the used market for about $13,000.

In general, the survey found most DEC users quite satisfied with their printers, and some models recorded zero failures on samples of up to 380,000 run hours.

Among those surveyed with high-end LPS40s, however, 67% reported frequent failures. In 1988, DEC field engineers improved reliability problems on the LPS40 by replacing the toner cleaning unit and changing some hardware designed to improve paper alignment, DEC spokesman Rick Goldberg said.

"We are not aware of any major reliability problems since then," Goldberg said.

The sites reporting higher failure rates tended to be those where printers were used very heavily over long periods.

One West Coast user, who asked to remain anonymous, started having trouble with an LPS40 printer about two months ago. The print quality declined rapidly, leaving copies smudged and often illegible.

"We had engineers here for two weeks trying to find out what the problem was," the user said. "I think they've replaced everything in the machine: engine, print units and rollers."

The Reliability Ratings survey examined four types of printers: dot matrix, line matrix, band and laser. Printers at the low end — such as the LN03 and LN50 — garnered glowing reports for reliable performance. The LN05, priced new at less than $2,400, ran for more than 207,000 hours without failure.

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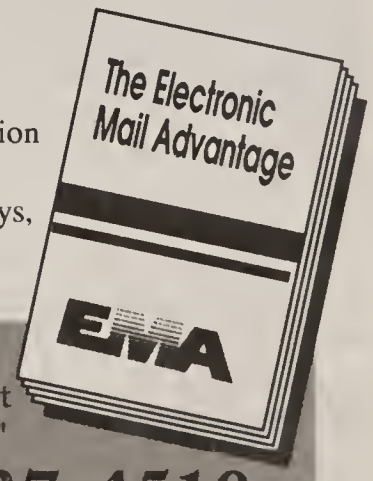


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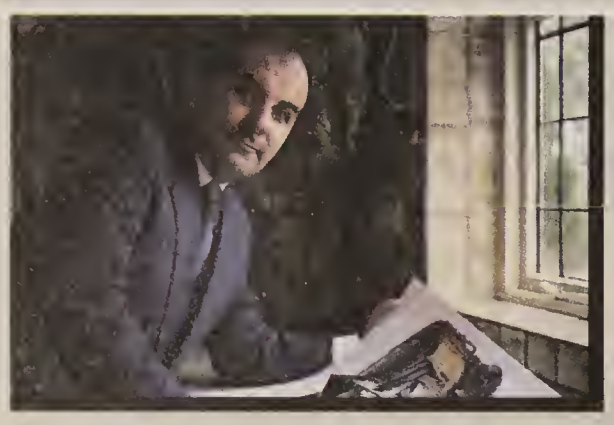

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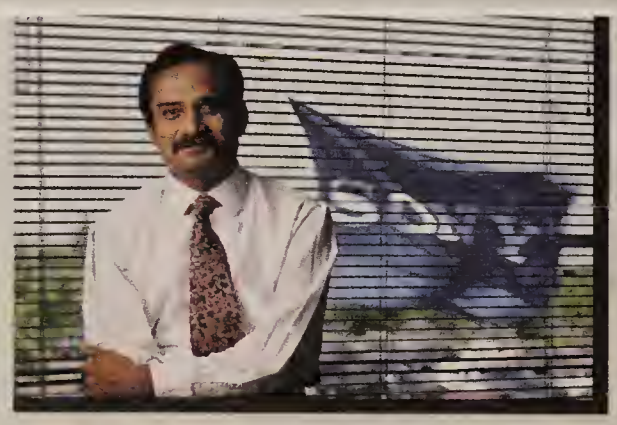

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In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, *more than 80 percent had experienced gains of from 2-to-1 to 10-to-1.* (See chart.)

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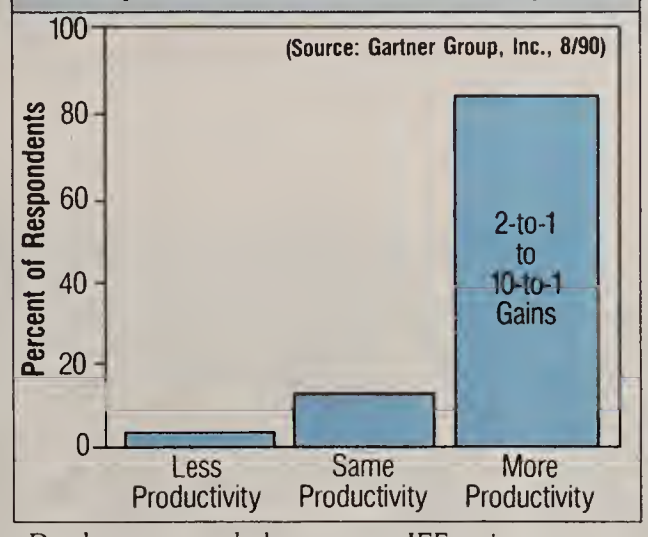


*Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.*

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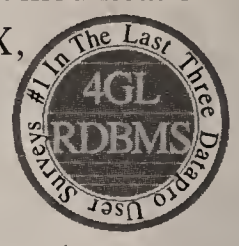


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# SQL*Net tackles connectivity

*Systems-level design helps all Oracle platforms to communicate*

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Corp.'s enhanced communications software, SQL*Net Version 2.0, allows one Oracle database application to connect with another — without specifying how the two computers hosting the databases interconnect.

By year's end, SQL*Net 2.0 will be shipped to customers, gradually replacing the 5-year-old SQL*Net 1.0 software used at roughly half of all Oracle sites.

The software, announced at the International Oracle Users Group (IOUG) meeting in Miami Beach earlier this month, addresses reliability and connectivity problems experienced by SQL*Net 1.0 users. The move comes as Oracle adds distributed database features to its core Oracle relational database — and as client/server computing becomes more widespread.

**How does it do it?**

Industry analysts said SQL*Net 2.0 works by separating the physical connectivity layers of Oracle's networking software from pure application code written by IS programmers. "It's a systems-level design and implementation," said Craig Burton, president and chief executive officer of Clarke Burton Corp., a Salt Lake City consulting firm. "It means that all the platforms on which Oracle runs can now communicate with each other."

Oracle had been dependent on interoperability features provided by Unix International and Open Software Foundation members. "The computer vendors were addressing the interoperability of [network] transports, so that one machine can talk to another without having the applications deal with the connectivity issue," Burton said. "But Oracle went off and solved the problem because it could not wait for all the vendors to do it."

SQL*Net 2.0 will be packaged with a companion product, the Multiprotocol Interchange, which will act as a universal switching point for networking protocols. Users will write applications for the local Oracle database's SQL*Net interface. In turn, SQL*Net 2.0 can access the Multiprotocol Interchange to do cross-network connections, if necessary.

"By writing one new [protocol adapter], all of the clients in a given LAN can access all the servers," said Smokey Wallace, general manager of Oracle's Network Products Division. The Multiprotocol Interchange can be installed on one or more computers in a corporate network, he said. Pricing for SQL*Net 2.0 will be pegged at some fraction of the Oracle database price for a given hardware platform; a pricing schedule has not been set.

The revised SQL*Net code appears to address user concerns about links between end users' personal computer local-area networks and Oracle database servers on Unix machines. One common workaround was to allow PCs to emulate Unix terminals, said Jay Verkler, director of development at Oracle's Network Products Division.

One beta-test site used SQL*Net 2.0 to solve this LAN-to-server problem. "We want to move our Novell LAN and our Unix server closer together," said Darren Undershultz, supervisor of technical support at Agricultural Development Corp. in Camrose, Alberta. "We want to quit developing Oracle applications on our mainframe."

The Canadian site plans to finish its 2-month-old SQL*Net 2.0 project by January. It is using 200 Compaq Computer Corp. PCs on a Novell, Inc. LAN as clients and a single IBM RISC System/6000 Unix machine on a Transmission Control Protocol/Internet Protocol network as a server.

Early users of SQL*Net 2.0 are scarce. However, users of SQL*Net 1.0 questioned at the IOUG meeting said the SQL*Net software would streamline development.

# Customer service the ticket at retail show

BY ELLIS BOOKER
CW STAFF

CHICAGO — Customer service will be the competitive watchword for retailers in the 1990s, and technology stands to make a difference, according to industry information systems executives, many of whom are funding a panorama of technologies they say will make shopping easier and more efficient for consumer and salesperson alike.

The most conspicuous changes are occurring on showroom floors and in checkout lines, where cash registers are fast evolving into multifunctional, intelligent, networked workstations "rather than just something to ring up a sale," said Stewart Neill, vice president of MIS at Saks Fifth Avenue in New York.

Neill was one of about 2,000 retail-industry IS professionals in Chicago last week for the 33rd annual Retail Information Systems Conference (Riscon), sponsored by the National Retail Federation, Inc.

**Search for POS system**

Two years ago at Saks, for example, a search began for a point-of-sale (POS) system that would let "the sales associate at the register do whatever is necessary to service the customer or perform their job," Neill said.

The system Saks is now deploying looks very much like a personal computer, with a full screen and a full alphanumeric keyboard.

POS systems are also in the works at other retailers. "At Laura Ashley, we truly believe there will be megaretailers who will dominate one end of the marketplace . . . and on the other end will be those specialty stores that survive by serving their niche and being very close to the customer," said Frank W. Andrews, vice president of MIS at Laura Ashley, Inc., based in Mahwah, N.J.

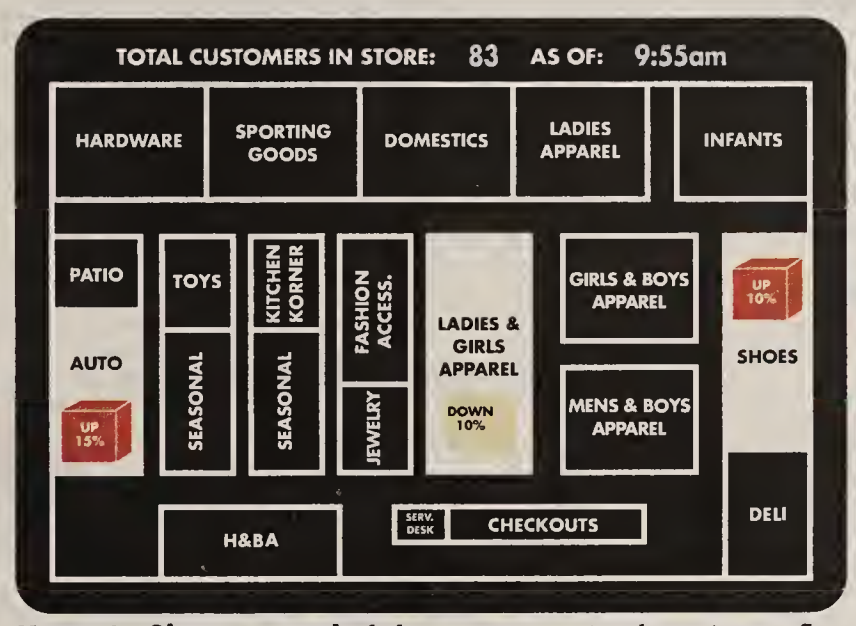
What shoppers most want, Andrews said, is to find the merchandise they seek when they walk into a store. Thus, a great deal of work at Laura Ashley has been on applications related to inventory management, he said.

Within the next three months, in fact, salespeople in Laura Ashley stores will be able to locate a dress at other Laura Ashley stores in their area from their POS terminals. "The salesperson can actually check the inventory of those other stores and either send the customer to them or order the goods then and there," Andrews said.

Changes are also due for the way in which customers select goods. Both Siemens Nixdorf Information Systems, Inc. and NCR Corp. demonstrated automated teller machine-like devices that let a customer browse through video clips of inventory and order with a credit card.

Even the time-honored tradition of signing a check or a credit slip is ripe for a technological update. NCR, one of the 135 exhibitors at Riscon, introduced a signature capture system called the NCR 5980.

A paper receipt is slid between a plastic clip and the pressure-sensitive writing area on the NCR 5980. When the customer signs, the signature is maintained as part of the electronic record, eliminating the need to file a paper copy.




**Kmart's Shoppertrack** *helps managers track customer flow and deploy salespeople*

Even the mundane business of entering and leaving a store has come under IS scrutiny. Kmart Corp. revealed at the conference that it would test through November an infrared light sensor system to track the comings and goings of customers in its stores.

Shoppertrak, from the Datatec Industries unit of Tytronix Corp. in Fairfield, N.J., counts customers as they pass under sensors mounted on the store ceilings. The system, integrated with Kmart's POS systems at the front of the stores, will allow better predictions of customer traffic, employee scheduling and the success of in-store advertising, said David M. Carlson, senior vice president of Kmart's corporate IS.

As retailers spoke excitedly about using information technology to "exploit" information about customers and to serve them better, others sounded alarms, worried that these systems will compromise privacy.

"Most Americans have no idea [of] the extent of the information held about them," David F. Linowes, professor of political economy and public policy at the University of Illinois, said in an address at Riscon.

Linowes implied that even the data collectors — increasingly retailers — would be shocked at how their databases are being manipulated by the third parties that buy them.

Yet marketing customer databases is one of the hottest topics for retailers today, according to Terry E. Houff, an Ernst & Young analyst.

NEW DEALS

## Ohio Link hooks up with DEC network

The **Ohio Library and Information Network** (Ohio Link) has picked **Digital Equipment Corp.** to supply $4.5 million worth of computer systems for one of the largest statewide library and information networks ever attempted in that state. DEC and Innovative Interfaces, Inc. will automate and network a consortium of 17 Ohio universities participating in Ohio Link, which will cost an estimated $23.5 million to complete. Decsystem 5500 RISC/Ultrix systems will be the common platform running Innovative's library automation software in the universities and at the State Library of Ohio.

**The Industrial Bank of Japan International Ltd.** and **First International Bank of Israel** have signed on to run Manof Integrated (Mint) software that links both banks to the SWIFT international banking network via Stratus Computer, Inc. XA2000 fault-tolerant computers. The Mint software was developed by Manof Systems Ltd. in Tel Aviv, one of Stratus' third-party marketing partners in the banking industry. The Mint gateway supports international electronic funds transfer for a range of banking services.

**American Airlines Decision Technologies** (AADT) in Dallas has announced the installation of a yield-management system for **Amtrak**, the national passenger railroad. The fully automated management system, jointly developed by AADT and Amtrak, was designed to increase revenue and profits through more effective reservation and inventory control.

# Bozman

CONTINUED FROM PAGE 27

away California.

Why did he design the system this way?

"In a PC network, every time you want to add something to your network, you have to buy another box," Alessandro said. "You might want an [electronic mail] server, a fax server or a database server. By using a Unix server, I can put all my applications in one box, and that reduces the overall complexity."

One more reason for using a Unix server is capacity: Textron Financial's local database takes up 600M bytes of disk drive capacity — quite a lot for a PC to handle.

Several vendors have packaged Unix servers as appropriate anchors for PC applications; prime among them are The Santa Cruz Operation and Interactive Systems. More are on the way. For example, Gupta Technologies, which makes IBM Systems Application Architecture-compatible client/server software, is building a series of Unix database servers for resale with NCR's Cooperation series of office systems.

Chronic concerns about Unix security in corporate offices may fade over time as software vendors include security features with their operating systems. Unix System Laboratories (USL) recently said it would ship a secure version of Unix System V Release 4. Database vendors such as Sybase and Oracle already ship secure versions of their database software for Unix machines.

Further, most independent database vendors have gateways that can link Unix servers with the two predominant types of corporate hosts: IBM mainframes and DEC VAXs. Most PC-LAN databases for OS/2 machines do not yet have that level of connectivity.

Even as Unix servers help to "upsize" PC-based LAN applications, they will become a platform of choice when mainframe applications get "downsized" to departmental business units. Unix transaction processors are a cost-effective alternative to more expensive mainframes, especially in terms of ratios of cost per million instructions per second.

**SEVERAL VENDORS have packaged Unix servers as appropriate anchors for PC applications.**

A number of high-end Unix servers — such as those made by Pyramid Technology, Sequent Computer Systems and AT&T's NCR subsidiary — can handle mainframe-size jobs. That much was made clear by Hyatt's recent switch from an IBM 4381 to a set of four AT&T System 7000 computers, which are based on Pyramid machines.

It could turn out that the industry has come full circle when it comes to departmental computing. The minicomputer of the '70s was rejected by the PC boosters of the '80s. But the work load of multiple server tasks has, in many cases, proved to be too great for some of the best outfitted PCs — requiring lots of megabytes of main memory and lots of disk storage for large databases. The result has been slow response times and poor performance of database applications.

In effect, the open Unix servers on the market may be stepping into the niche long held by those proprietary minicomputers of old. If that happens, it will only lend emphasis to IBM's Sept. 11 announcement that heralded the "Integration of the Enterprise." Even IBM had to concede that most IS shops are multivendor shops and that the key corporate data is being scattered throughout the enterprise, even to Unix servers.

Bozman is *Computerworld*'s West Coast senior editor.

# DEC enters OEM market

MAYNARD, Mass. — Much like its rival IBM, Digital Equipment Corp. will now be hawking its own disk drive technology as an OEM.

DEC recently announced its entry into the OEM market with two storage devices designed for personal computers, workstations, file servers and midrange multiuser systems.

"Now DEC is in the OEM business like everybody else: IBM, Hewlett-Packard, Fujitsu and Hitachi," said Robert Callery, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. "If you have the capacity and manufacturing capability to supply disks in quantity, why not sell to whoever you can?"

The DSP5200, which DEC claims is the industry's largest capacity 5¼-in. drive available in volume, is a small computer systems interface (SCSI) Winchester device with a formatted capacity of 2G bytes and a peak data transfer rate of 2.2M byte/sec. The 5200 is being manufactured at a DEC facility in Kaufbeuren, Germany, and is priced at $3,000.

The DSP3080 is a compact, 3½-in. SCSI Winchester disk for PCs and workstations, priced at $2,000, with special features for file servers and high-performance disk arrays. Its peak data-transfer rate is 2.7M byte/sec.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# CDC adds multiprocessor to server line

BY ELLIS BOOKER
CW STAFF

MINNEAPOLIS — Control Data Corp. recently expanded the range of its Unix server line, adding its first multiprocessor systems.

The firm can now claim a scalable Unix line, ranging from a $15,000 single-processor server to the new $325,650 Infoserver 4680. The Infoserver can be configured with up to four processors, each handling 68 million instructions per second.

Equally important, however, the servers represent another milestone in CDC's transition from a vendor of proprietary mainframes to one of open systems.

"We envision by the 1993 time frame, our open systems revenues will surpass our proprietary [systems] revenues," said James E. Ousley, president of the company's Computer Products Group.

Ousley said sales of open systems, including the Unix servers and workstations, will represent about 25% of CDC's business — more than $200 million — this year.

The departmental Infoserver 4370 and 4375 and the Infoserver 4680 are built around the Mips Computer Systems, Inc. R3000A and R6000A microprocessor technology, respectively.

The high-end 4680 was co-developed by Mips, which will be allowed to market the product to its OEM customers in mid-1992.

### Good reports

Early users of the Infoservers were pleased by the units and by the progress in their vendor's open systems strategy.

"Six months ago, [CDC customers] didn't like the message they were hearing about proprietary systems not being around forever," acknowledged Lee Croatt, vice president of the CDC users group VIM, Inc. "But at the recent meeting, people were very supportive of the strategy. They understand Unix will be a fact of life."

Croatt, who is also director of computer and information systems at the University of Minnesota in Minneapolis, upgraded his single-processor 4000 to a two-processor system a few weeks ago. The field upgrade required a 3-hour load of the new version of the operating system and a 1- to 1½-hour powerdown while the new hardware boards were installed.

Selling the Infoserver to the installed based of Cyber mainframe sites will not be enough, said John Morrell, a senior analyst in the Unix service at International Data Corp. in Framingham, Mass.

"They've got to get out in the world because sooner or later you run out of that base," he said.

Morrell, who estimated CDC has sold a little more than 100 of the Mips-based servers to date, noted the vendor has been fortunate in having a good presence in government and manufacturing, two large Unix vertical markets.

All the Infoservers run under EP/IX, CDC's symmetric multiprocessing operating system.

# Andersen

CONTINUED FROM PAGE 27

als, work in process and finished goods. It also tracks information required by regulatory authorities such as the Occupational Safety and Health Administration and the Environmental Protection Agency.

Process/1 uses a distributed architecture, based on Digital Equipment Corp. VAXs and DEC's Network Application Support approach to distributed computing. Another building block is Foundation, Andersen's computer-aided software engineering tool.

Functionally, the software sits between process-control devices on the plant floor and corporate, enterprise-level business systems.

Prices begin at $150,000. Andersen said it will bring forth enterprise-level applications integrated with Process/1 next year. Those applications will include customer service/logistics, operations accounting and resource planning.

Process/1's architecture "is the first one to come out and address all three" areas of manufacturing control, according to Bruce Richardson, vice president of AMR Strategic Services in Cambridge, Mass. Those areas are multiplant, intraplant and plant-floor information systems.

Richardson said he expects all the major software vendors to begin approaching the marketplace this way. He noted that one of the most popular off-the-shelf programs for process manufacturing today, IBM's Personal System/2-based Process Operations Management Systems, tackles only plant-floor management, although it does provide links to IBM and non-IBM software systems for plantwide and multiplant management.

Finally, Richardson said he suspected Andersen's account strategy is to enter manufacturing companies by way of the factory door but later to sell business systems, integrated with these solutions, to the corporate staff. "They're well-positioned since they have the services expertise and the product expertise," he said.

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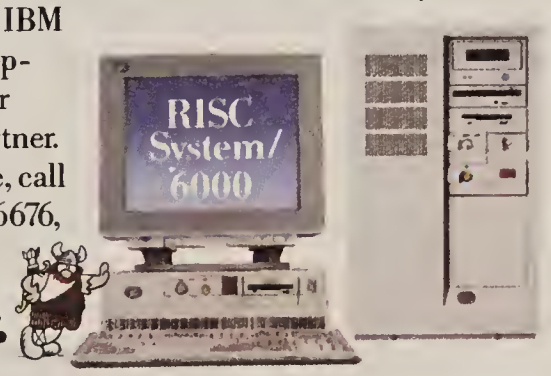


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# Practicality tops data administrators' lists

BY JOHANNA AMBROSIO
CW STAFF

Data administrators must find more ways to put into practice what they have long known in theory: Information is a corporate resource only as good as its accuracy and its ability to be found when needed.

This was the theme of a recent gathering of the Data Administration Management Association (DAMA) International, held recently in Seattle. The group is based in Palatine, Ill., and has 22 chapters and 3,000 members.

At the meeting, attendees talked about improved ways to build bridges to their business end users by providing more practical products and services, things that are useful in a relatively small time frame.

"Data administration has gotten to be a very academic exercise because you're building this corporate information model, but you're not really supporting anyone," said Susan Farenci, a data administrator at Depository Trust Co. in New York and a DAMA International vice president. "We're just trying to become more useful in a practical way and help make our companies more profitable."

Professionals involved in data administration differentiate it from a related field, database administration. The former involves looking at a business requirement and figuring out what information can best support the application, what the company possesses already and what it may need that is new. As such, data administrators work with systems analysts and end users to decide what is needed.

In contrast, database administrators are more technical in nature. They implement the theories and maintain and tune the databases.

### What a concept

At some companies one staff does both tasks, but at others the jobs are more segmented. "Data administration is a relatively new field," said Patricia Cupoli, DAMA International president. "Although relational has been around as a concept for a decade, it's just now catching on, and we're not even in the salary surveys yet."

And so, data administrators said, it is important to produce the short-term goods as well as keep the longer term corporate information model in mind. Among the things that data administrators are doing at some companies are helping evaluate computer-aided software engineering tools — and, along the way, teaching data modeling concepts to programmers and others, helping define an English-like query system for all applications and helping define the company's information warehouse concept of getting all data to all appropriate users.

Doing these things will also help ensure job security. "Data administration is sometimes the first area to be cut," Cupoli said. "We're a long-term asset relating more to standardization, quality and reusable information."

Cupoli should know. Earlier this year, she was laid off from one organization and searched for two months before landing her current job as supervisor of data administration at Unocal Corp. in Schaumburg, Ill. "Perhaps the area is just not valued that much; perhaps we've just not sold it correctly," she said.

Data administration can be sold as a quality-enhancing asset, especially now, when many companies are embarking on such programs corporatewide. Farenci said she has tried to quantify for her management how much money her group saves in redundant data and how much it costs for storage devices and programmers to maintain that data.

Another thing helping the profession along, Farenci and Cupoli agreed, is IBM's "blessing" of the concept of data administration with its Information Warehouse and AD/Cycle strategies, both of which rely heavily on data administration. "IBM has legitimized it," Farenci said.

At this year's meeting, Cupoli said, data administrators were eager for tips on how to handle other forms of information besides data, including objects, images, voice and graphics. "Data administration is evolving into something much broader than what it started out to be," she said. "The profession is changing, so the user group must change to keep up."

# TPC releases benchmarks

Hewlett-Packard Co.'s HP 3000 Series 975LX and Data General Corp.'s Aviion AV 5225 nailed the best price/performance ratings in the latest evaluations of the Transaction Processing Council (TPC).

In the TPC-A benchmark, which measures on-line transaction processing in test sessions involving multiple terminals with high I/O and transaction integrity, Hewlett-Packard's Series 957LX came in with the lowest cost per transaction, at $13,720.

Second in line was the AT&T/NCR Starserver E, which came in at $14,520 per transaction.

The TPC-B benchmark, which has the same parameters without multiple terminal sessions, found DG's Aviion tops at $2,321 per transaction.

That price/performance ratio was followed closely by Mips Computer Systems, Inc.'s RC3330, at $2,417 per transaction.

Those price/performance numbers link the average transactions-per-second figure to the five-year cost of ownership for the system, including terminals.

This is the second set of results from TPC; the first were released in June.

TPC is a nonprofit group composed of 44 members, including Digital Equipment Corp. and Texas Instruments, Inc.


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## NEW PRODUCTS — SOFTWARE

### Applications packages

Diagonal Data Corp. has announced Version 1.1 of its Hemisphere Advanced Level System (ALS) plant and facility maintenance software.

Enhancements include bar-coding capability in the inventory module, condensed Work Order Planning and a Past Due Procedures Reporting feature.

Hemisphere ALS runs on Digital Equipment Corp. VAX systems as well as Unix-based systems and local-area networks.

Pricing for Hemisphere ALS starts at approximately $12,000.

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Excalibur Technologies Corp. has announced Pixtex/EFS, an electronic filing system with pattern-recognition capabilities.

Both text and graphical information can be stored with the product. It features a compression algorithm reducing files to as little as 5% of their original size, according to the company. Pixtex/EFS can retrieve information by inexact queries due to its pattern-recognition features.

The software currently runs on Digital Equipment Corp.'s VAX and Ultrix systems.

Pricing ranges from $23,600 to $246,800, depending on configuration.

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### Unix software

Information Resources, Inc. has released a new version of Cosort for Unix-based systems.

Cosort Version 2.5 features a revamped user interface and improved performance in sort/merge functions. Cosort now runs up to four times faster than the Unix sort function, according to the company. Support for Micro Focus, Inc. and Ryan-McFarland Corp. data types has also been added.

Pricing starts at $990 on multiuser Unix platforms.

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### Utilities

Competitive Technologies, Inc. has announced Capture/400, a screen capture utility for the IBM Application System/400.

Capture/400 runs inside existing applications and can save one or more images to separate files. The utility product costs $295.

Until Nov. 1, Capture/400 is being bundled with Trans/SQL Jr., the company's low-end SQL application, at no extra charge. Trans/SQL Jr. offers multiple Select statements and runtime macro substitution. It operates in interactive or batch mode.

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COMMENTARY

*Carol Hildebrand*

# Of words and Windows

With all the bombast that's been shooting around about Windows word processing lately, you'd think that half the world's population spends time feverishly gripping a mouse and gurgling happily as they drag text hither and yon.

It seems that every company not currently on a slab in the industry morgue is coming out with a Windows word processor. Wordstar, NBI, Microsoft, Lotus, Software Publishing and Describe all have them. Wordperfect's has been imminent for what seems like years, and Borland must have one in the pipeline, since it bought the Legacy engine from NBI. Even Wang snapped out of rigor mortis long enough to introduce Upword.

Judging from all this activity, it looks like vendors are hoping users will think a graphical word processing environment is the greatest thing since the Earl of Sandwich slapped a hunk of meat between a couple of slices of bread. However, a few factors seem to indicate that users are not going to be imitating lemmings when it comes to switching environments and word processors.

• **Hardware bottleneck.** Es-

*Continued on page 44*

# Windows tool vendors get back to basics

BY JAMES DALY
CW STAFF

Watching Ray Strong nimbly tap his way through Microsoft Corp.'s Word 5.0 word processing package, you would think he was an expert.

Don't be fooled: He uses only a handful of the hundreds of sophisticated features the application provides — just enough to perform his job well. He does not even know where the manual is kept. "If I need to try something a little different, I can just thrash around and figure something out," said Strong, a senior analyst at Westinghouse Electric Corp. in Sunnyvale, Calif.

Strong is one of a growing number of corporate Windows users whose needs, or lack thereof, applications makers are scrambling to address. In recent weeks, developers have begun offering stripped-down, inexpensive versions of their popular applications designed specifically for customers who simply do not require all the elaborate features — and price — of the full-function versions.

**A fistful of features**

"We put in hundreds of features and people only use a handful, so they're hesitant to buy a second or third copy for the office or to take home at night," said Shelly Julien, a product line manager at Asymetrix Corp. in Bellevue, Wash.

Asymetrix recently extracted specific features from its Toolbook applications development kit and packaged each one individually. Its low-end Window offerings now include an entry-level database (Instant Database) as well as a presentation graphics offering (Displaybook) and a personal scheduler (Daybook Plus). The applications will start at $49 when general availability begins later this fall.

Similar boiled-down applications have arrived from Borland International, Inc. and Microsoft

*Continued on page 48*

# Compaq's Portable 486C leads pack

BY MICHAEL FITZGERALD
CW STAFF

While Compaq Computer Corp.'s Portable 486C color portable headed the list of announcements in the portable products arena last week, it was far from the only product on the roster.

The Portable 486C drew mixed reviews from analysts, in part because of its 17.6-pound weight.

"It's a good product, technologically, but this is a niche market," said Richard Zwetchkenbaum, senior personal computer analyst at International Data Corp. in Framingham, Mass. "They get some mind share out of it and may get a technological edge dealing with the color."

Zwetchkenbaum said a more effective strategy is Epson America, Inc.'s approach of aiming at the notebook market with its active matrix screen.

But John Dunkle, vice president of Workgroup Technologies, Inc. in Hampton, N.H., said Compaq was tapping into a viable market with the luggable.

"Is it going to be a long-term, key, cornerstone, strategic product? No," Dunkle said. "But it's going to be a lucrative market, for sure."

Workgroup Technologies estimated the overall luggable market at 250,000 units in 1992. Dunkle said that even if the Compaq box, which replaces its current Portable 3 luggable, captures 10% of the market — a number he said he thinks is conservative — it would be a worthwhile product.

Meanwhile, Dolch Computer Corp., which released a color portable with an Extended Industry Standard Architecture bus and a 486 chip last year, announced a new line of AC-powered, liquid-cooled portables under 13 pounds.

Dolch's products will use chips from both Intel and Advanced Micro Devices, Inc. Pricing will range from $5,995 to $9,995, and the products will ship in volume in the first quarter of next year. The optional color screen will cost an additional $3,995.

**Compaq's portable** *sports a color display*

Grid Systems Corp. enhanced its notebook line, offering its Grid 1750 notebook with a cellular modem from Powertek Industries, Inc. in Englewood, Colo. The two units combined weigh 11 pounds. Grid also announced it will begin offering users the option of an internal 9.6K bit/sec. fax/data modem in December.

Acer America Corp. will ship an upgradable laptop, the Anyware W486S, with a 20-MHz 486SX and will allow users to upgrade to a 25-MHz 486DX. The portable will use an Acer-developed configuration utility that will automatically reconfigure the machine. The Anyware W486S will come with 4M bytes of random-access memory and either a 120M- or 200M-byte hard drive.


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* SunSoft, Inc.'s Solaris 2.0 is scheduled for release in the first half of 1992.

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PC & WORKSTATION SHORTS

## Zenith Data builds 486

**Zenith Data Systems** has announced a personal computer based on **Intel Corp.**'s 33-MHz I486SX chip. The Z-486/33E comes with a Texas Instruments, Inc. Graphics Architecture card, which yields up to 1,024- by 768-pixel resolution using 256 colors. Also included are 4M bytes of memory, expandable to 64M bytes, three Extended Industry Standard Architecture (EISA) bus slots, a mouse, MS-DOS 5.0 and **Microsoft Corp.**'s Windows 3.0. The Z-486/33E Model 400 comes with a 400M-byte hard drive for $9,699. The Model 200 comes with a 200M-byte hard drive for $8,799.

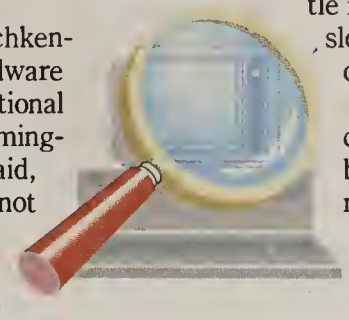
**Bitwise Designs, Inc.** recently cut prices on most of its portable and desktop PC products by up to 42%. Bitwise, based in Troy, N.Y., made its biggest price cut on the Model 433E, based on Intel's 33-MHz I486 processor. The Model 433E, based on the EISA bus, comes with IBM's Super VGA and a 200M-byte hard drive. Bitwise cut the 433E's price from $8,995 to $5,195. In addition, the company dropped the price on its best-seller, the Model 333C, an Intel 80386DX-based desktop, from $2,995 to $2,195.

# Few users make the upgrade

*Modular computers continue to get lots of attention but little action*

BY MICHAEL FITZGERALD
CW STAFF

Upgrading is a hot concept in desktop computing today, but it seems to be more fuss than firmament, according to users and analysts.



Richard Zwetchkenbaum, a senior hardware analyst at International Data Corp. in Framingham, Mass., said, "[Upgrading] is not taking the marketplace by storm, but it's here, and it's important."

Some users speak highly of the option to buy upgradable machines, but many also seem to be giving the concept little more than lip service.

"Our users are constantly outgrowing our PCs," said Eugene Murtha, vice president of MIS at Spencer Gifts, Inc., based in Pleasantville, N.J. But, Murtha added, Spencer recently purchased a few boxes from Gateway 2000 Ltd., a mail-order company in North Sioux City, S.D., taking the low-cost route over easy upgradability.

Gary Whipple, assistant director of environmental affairs at Union Carbide Chemicals and Plastics, Inc. in Danbury, Conn., said the firm bought IBM Personal System/2s in part because of the upgradable nature of the Micro Channel Architecture. Union Carbide has upgraded processors and random-access memory using boards from Aox Corp., but, Whipple said, "upgradability is not going to sway us" in purchasing decisions.

Other users are leery of upgrading.

"If you really look at it, I don't think it's a wise idea," said Bruce Greif, project analyst at County Natwest, Inc. in New York. Greif said he thinks vendors build their upgradable machines in such a way as to lock the user into the company's proprietary bus variations. He added that he sees little reason to move from slow chips to fast chips.

"I still am not convinced that anybody upgrades the majority of these products they end up buying," added Gerard M. Nussbaum, director of MIS at Premier Hospitals Alliance, Inc. in Westchester, Ill. Nussbaum cites the cost of upgrading video cards, the bus and other items.

Dealers reported little interest in actually upgrading once an upgradable machine is purchased.

"It's like a VCR — you buy one with all these fancy options, and then you use three: play, rewind and record," said Samuel Adicoff, president of PC Edge, Inc., a reseller based in San Jose, Calif. Adicoff said he has yet to sell an upgrade to a customer.

"Three years down the road, a 486/33 is going to be old technology, so down the line ... you're better off buying a new computer," Adicoff noted.

Upgrading is by no means new. Practically any PC can be upgraded with enough elbow grease. AST Research, Inc., among others, has offered easy-to-replace processor upgrades since 1989.

But AST's Larry Fortmuller, director of high-performance systems, concedes that few of AST's customers have upgraded. Still, he projects that in six months to a year, as depreciation cycles end, 20% of the firm's desktop users and perhaps 70% of its server users will upgrade.

Vendors said they liked building upgradable machines for a variety of reasons, not least of which is that it makes them look as they are helping users protect an investment. Compaq Computer Corp. cited significant cost savings on the manufacturing side when it announced its Deskpro/M line several weeks ago [CW, Sept. 16].

However, upgrading within the M line is more expensive than just buying a machine with a more powerful processor, and Compaq is not the only vendor for which this is the case.

> "IT'S LIKE A VCR — you buy one with all these fancy options, and then you use three: play, rewind and record."
>
> SAMUEL ADICOFF
> PC EDGE

# NEC color monitors cater to Windows

BY CLINTON WILDER
CW STAFF

WOOD DALE, Ill. — Targeting the growing market of Microsoft Corp. Windows users, NEC Technologies, Inc. recently introduced a line of color monitors with larger, flatter screens for Windows applications.

The four new additions to the Multisync product line represent NEC's first major product line upgrade in three years. Although NEC touted its new Accucolor Control system, which lets users coordinate on-screen colors with color outputs from printers and other peripherals, analysts were more impressed with the suggested retail price of $749 on the one new monitor without Accucolor Control.

### On the market

The 15-in., flat-square screen Multisync 3FGx at that price should sell in the $600 to $700 range to users, said Katherine Bull, an industry analyst at Dataquest, Inc. in San Jose, Calif. The product should be very competitive with 14-in. displays selling for around $450, she added.

"The 15-in. screen really gives the user 1¼ inches more space because of the flat-square display," Bull said. "That's an excellent price point. We're very bullish on these larger 15-in. and 17-in. screens for Windows users."

NEC's 17-in. Multisync 5FG retails for $1,599. The firm also introduced a 21-in. Multisync 6FG for $3,499 and a 15-in. Multisync 4FG for $899. All three feature Accucolor Control, which will be an attractive feature for specialized applications such as publishing but not for most mainstream business applications, according to Joan Carol Brigham, director of graphics and Macintosh research at International Data Corp. in Framingham, Mass.

The 15-in. monitors will ship this month; the 17-in. and 21-in. models next month.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# Hildebrand

CONTINUED FROM PAGE 39

pecially untempted will be those who lack the physical capacity to run Windows, and research shows that there are significant numbers of those. Computer Intelligence/Infocorp in La Jolla, Calif., found that in a survey representing 142,000 sites and 7 million computers, 16% are Intel 80386SXs and DXs and fewer than 1% are I486s.

If you assume that half of the 43% of 80286s currently installed have enough memory and hard disk capacity to run Windows, that leaves us with a grand total of 37% of the surveyed sites that can even *think* about word processing with a mouse.

The rest get to consider whether spending big cash to give the administrative staff 386s so they can point and click to create a memo is worth the investment. Which brings us to the next point:

• **The nature of the beast.** The Lotuses and Microsofts of the world would love you to believe that a graphical environment is the best place to write letters and memos. For a certain population of word processing users, they are correct.

This is particularly true for those doing things such as creating newsletters — basically, using word processors for low-level desktop publishing. For them, such features as Dynamic Data Exchange and being able to change fonts on the fly is going to make their lives much easier.

However, for many users, it seems that the idea of Windows word processing has all the appeal of taking a shot in a sand trap.

First of all, what's the point of word processing? Text. Typing. One letter after another, in a lot of cases. Why do you need Windows for that?

In general, Windows word processing runs slower than a straight-ahead DOS application. In a serious data entry pool, Windows could actually slow production down. In such a situation, which I suspect is more the norm than otherwise, any worker inspired to jazz up a letter by fooling with the bold or fonts would very likely have his boss seeing pink slips.

• **And what's the big rush, anyway?** Wordperfect's Windows product is late — very. The people in Orem, Utah, are now swearing by a mid-October ship date. Microsoft is readying Word for a major upgrade, also in time for Comdex, rumor has it.

Lots of ink has been given over to speculation about what will happen if Wordperfect misses this target date and Microsoft sneaks in ahead with Word 2.0.

But frankly, what's the hurry? Granted, Wordperfect's tardiness has siphoned some impatient Windows converters into rival tanks. But this is a company that owns the DOS market. It has a 70% market share. What major company is not going to wait to see what Wordperfect comes up with before making a decision?

Analysts have also quoted Bill Gates as predicting that he will own 60% of the Windows-based word processing market in two years. Again, a little skepticism is in order. Think, once again, of that huge chunk of market Wordperfect owns. Brand loyalty aside, a lot of users are going to stick to what they know, particularly to a vendor with a toll-free support line as opposed to one whose lapses in that area are renowned.

A little math here is also instructive. Microsoft Word currently has a lock on the Windows word processing market, largely because it was there first. It owns 16% of the DOS market. Even if Microsoft converts all its character-based users, 60% still looks pretty optimistic.

And there are some very impressive competitors out there. Analysts have been positively gushing about Wordstar's product, predicting it could be the spoiler in this race. Better subtract about 10% market share for them. Wordperfect's product is going to have to rival Dbase IV on the horrific scale to lose them serious market share.

For those who need a graphical environment, waiting seems to be the wise choice.

Hildebrand is a *Computerworld* staff writer.

**FOR MANY USERS, it seems that the idea of Windows word processing has the appeal of a shot in a sand trap.**


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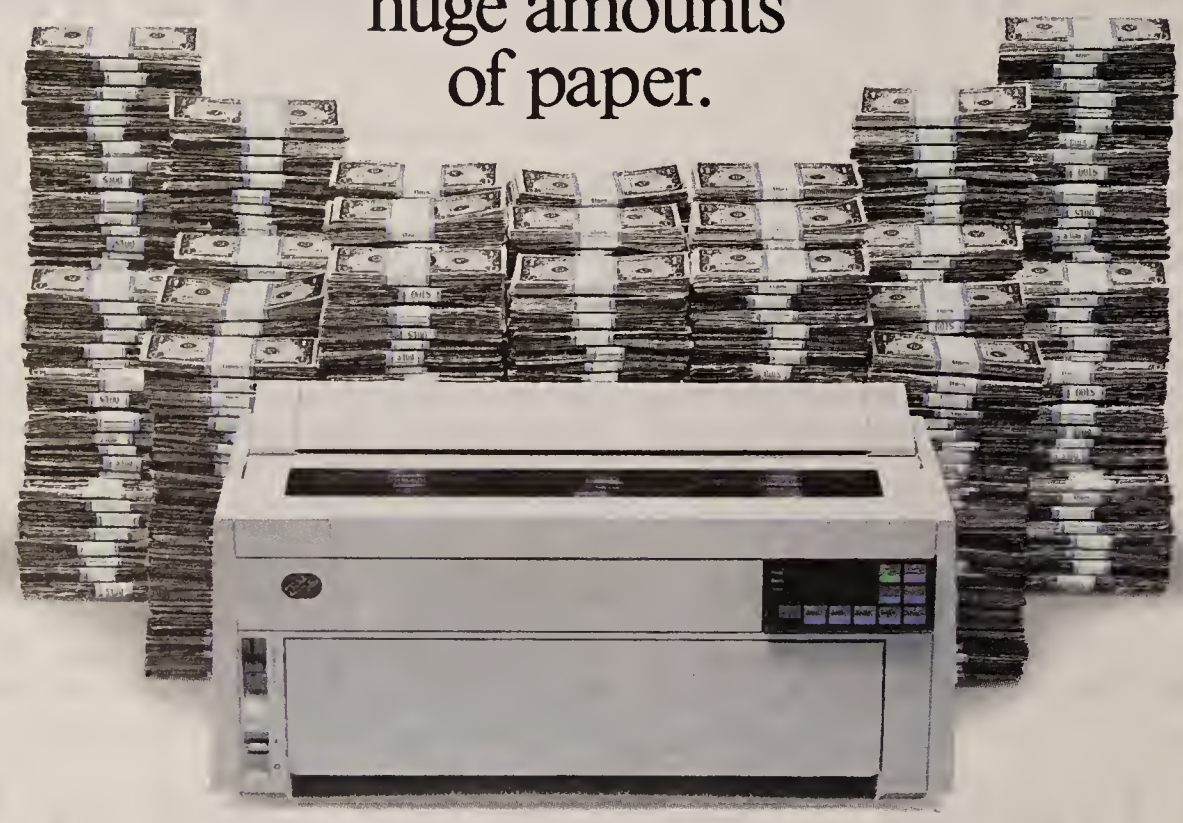

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# Stacker update doubles storage

CARLSBAD, Calif. — Stac Electronics, a privately held company, recently released Stacker 2.0, the second version of its hard disk compression software.

The product comes in a combination hardware coprocessor board and software for the desktop. A software-only version is specifically for use with portable computers. Stacker 2.0 will work with any AT-bus computer using an Intel Corp. 80286, 80386 or I486 processor and with IBM's Micro Channel Architecture (MCA) machines.

Stacker will double the storage space on any hard drive, the company claims. The portable version costs $149; the new Stacker AT/16, $249; and Stacker MC/16 for MCA, $299.

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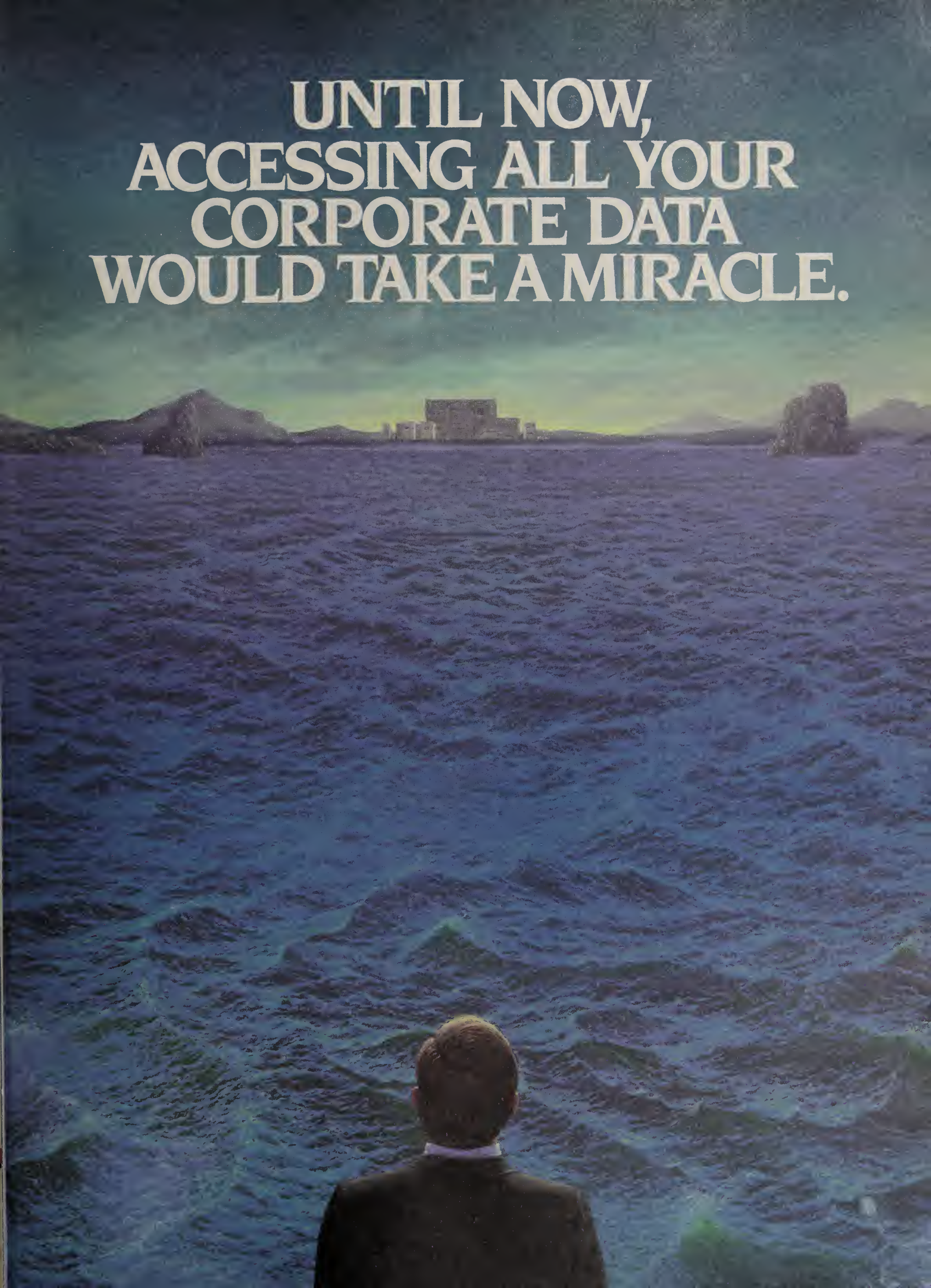

# PC Tools 7.0: Options make it great value

*Technology Analysis — A roundup of expert opinions about new products. Summaries written by freelance writer Suzanne Weixel.*

Version 7.0 of Central Point Software, Inc.'s PC Tools adds features to a popular product that already goes well beyond what is expected from a utilities package.

**Ease of use:** PC Tools presents an interface that features point-and-shoot command control as well as other options. Users reported bugs when using the Undelete, CP Backup and Swap functions. Reviewers suggested that the malfunctions might be due to nonstandard platform configurations rather than software problems.

**Variety of features:** PC Tools includes a new remote communications tool, a virus-detection utility, a customizable menu system, a time planner module and a word processor.

**Data recovery capabilities:** According to *Infoworld*, some of PC Tools' data protection and recovery utilities could easily pay for the entire package several times over.

**Windows compatibility:** PC Tools provides support for Microsoft Corp. Windows 3.0. It also includes Windows-specific versions of its Backup, Scheduler and Undelete modules.

**Value:** For $179, PC Tools gives users many options for a little more than the price of a single utility.

## Central Point Software's PC Tools 7.0

| Reviews | Ease of use | Variety of features | Data recovery | Windows compatibility | Value | Overall |
|---|---|---|---|---|---|---|
| *Infoworld* 7/15/91 | Very good | Wealth of unexpected features | Enhanced, very reliable | Has Windows-specific utilities | Excellent | 7.1* |
| *PC World* 7/91 | Improved | Fuller tool bag | Better backup | Well adapted to Windows | One of the top values | Nothing else quite like it |
| *PC Computing* 7/91 | Nice function-key shortcuts | Multipurpose value | New features | A step ahead of competition | Arguably the best single value | A grab bag bonanza |
| **Users** | | | | | | |
| **Wayne Tripp,** Monsanto Agricultural Co. | ■■ | ■■ | ■■ | ■■ | ■■ | Best interface |
| **Ed Rochelle,** Vivid Images | ■■ | ■■ | ■■ | ■■ | ■■ | Exceptionally easy to install |
| **William Castagne,** Visiting Nurse Service of New York | ■■ | ■■ | ■■ | ■■ | ■■ | Bigger and better for little cost |
| **Analysts** | | | | | | |
| **Earl Rich,** Faulkner Technical Reports | ■■ | ■▪ | ▪▪ | NC | ■■ | Intuitive, useful |
| **Andy Froning,** National Software Testing Labs | ■▪ | ■■ | NC | ■▪ | ■■ | Some problems on a network |
| **Peter Francis,** Dataquest, Inc. | ■■ | ■■ | ▪ | ■■ | ■■ | Good tool, good price |

Key: ■■ Very good ■▪ Good ▪▪ Fair ▪ Poor  Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. **Infoworld* rating based on 1-to-10 scale.

### Vendor background information

Central Point Software, a privately held company, reported that its revenue more than doubled for fiscal year 1991, ended in March. Revenue increased to $53.8 million, a 108% increase over 1990. Revenue for the first quarter of fiscal 1992, which ended in June, increased 24% over the same period last year to $16.7 million. The Beaverton, Ore.- based company has 315 employees and more than 1 million users of its products.

### Central Point responds

*Matthew Mosman, product manager:*

**Ease of use:** A maintenance release, 7.01, designed to fix most of the problems found in Version 7.0, should be available soon.

**Variety of features:** PC Tools is perceived as being large because it is often compared with programs that offer fewer features. It is a tight program, considering the depth of its functionality.

# Norton Utilities 6.0: NDOS major addition

## Symantec's Norton Utilities 6.0

| Reviews | Ease of use | Variety of features | Data recovery | Windows compatibility | Value | Overall |
|---|---|---|---|---|---|---|
| *Infoworld* 7/15/91 | Excellent | Evolutionary improvements | Handles all functions except backup | Now it's compatible | Very good | 8.5* |
| *PC Computing* 7/91 | Interface is simpler; Windows-like | Several improvements | Very good | Unerase won't work | NC | Classic choice |
| *PC Magazine* 9/10/91 | Easy, but a few flaws | Less range, but strong performers | Best single package for recovery | A few problems | Worth the price | Fine-tuned revision |
| **Users** | | | | | | |
| **Dean Pennington,** Consulting company | ■▪ | ■■ | ■▪ | NC | ■▪ | Trying too hard to be all things |
| **Gary Phifer,** Philips Cos. | ■■ | ■■ | ■■ | NC | ■■ | Couldn't live without it |
| **Bob Germer,** Rig Associates | ■▪ | ■■ | ■■ | ■■ | ■■ | NDOS alone is worth price |
| **Analysts** | | | | | | |
| **Earl Rich,** Faulkner Technical Reports | ■▪ | ■▪ | ■■ | NC | ■■ | Excellent data recovery tool |
| **Bobby Joe Reff,** National Software Testing Labs | ■■ | ■▪ | ■■ | NC | ■■ | A must-have |
| **Peter Francis,** Dataquest, Inc. | ■▪ | ■▪ | ■■ | ▪ | ■▪ | Unparalleled data recovery |

Key: ■■ Very good ■▪ Good ▪▪ Fair ▪ Poor  Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. **Infoworld* rating based on 1-to-10 scale.

### Vendor background information

Symantec, based in Cupertino, Calif., reported a 68% increase in net revenue for the first quarter of fiscal year 1992, ended in June. Net revenue rose to $38.3 million, compared with $22.9 million in the first quarter of 1991. Net income increased by 96% to $3.4 million, compared with $1.7 million. During the quarter, the company announced four Windows products, two Macintosh products and four upgrades, including Version 6.0 of Norton Utilities.

### Symantec responds

*Marty Rubenstein, product manager:*

**Variety of features:** We try to keep Norton Utilities focused as a data protection and data recovery product. Features are included based on customer requests.

**Windows compatibility:** Norton Utilities is not a Windows application. We have products designed specifically for Windows.

Long respected for its data recovery features, Symantec Corp.'s Norton Utilities Version 6.0 has been updated to include a powerful command interpreter that, some reviewers said, is what DOS 5.0 should have been.

**Ease of use:** The revised interface is similar to Microsoft Corp. Windows 3.0, with well-designed screens and mouse support.

**Variety of features:** Version 6.0 does not represent a dramatic update, but it does add some nice features, reviewers said. For instance, the Norton Change Directory has finally acquired Prune and Graft functions for directory trees. One of the most notable additions is NDOS, a replacement command interpreter that enhances DOS capabilities. But the package still lacks some things, reviewers noted.

**Data recovery capabilities:** Norton Utilities is possibly the most complete collection of data protection and recovery utilities available.

**Windows compatibility:** Norton Utilities runs under Windows as a DOS application. As such, it does not always provide complete functionality. For instance, Unerase does not work under Windows.

**Value:** According to *Infoworld*, Norton Utilities should be in every serious computer user's software library. NDOS alone is worth the $179 price tag.

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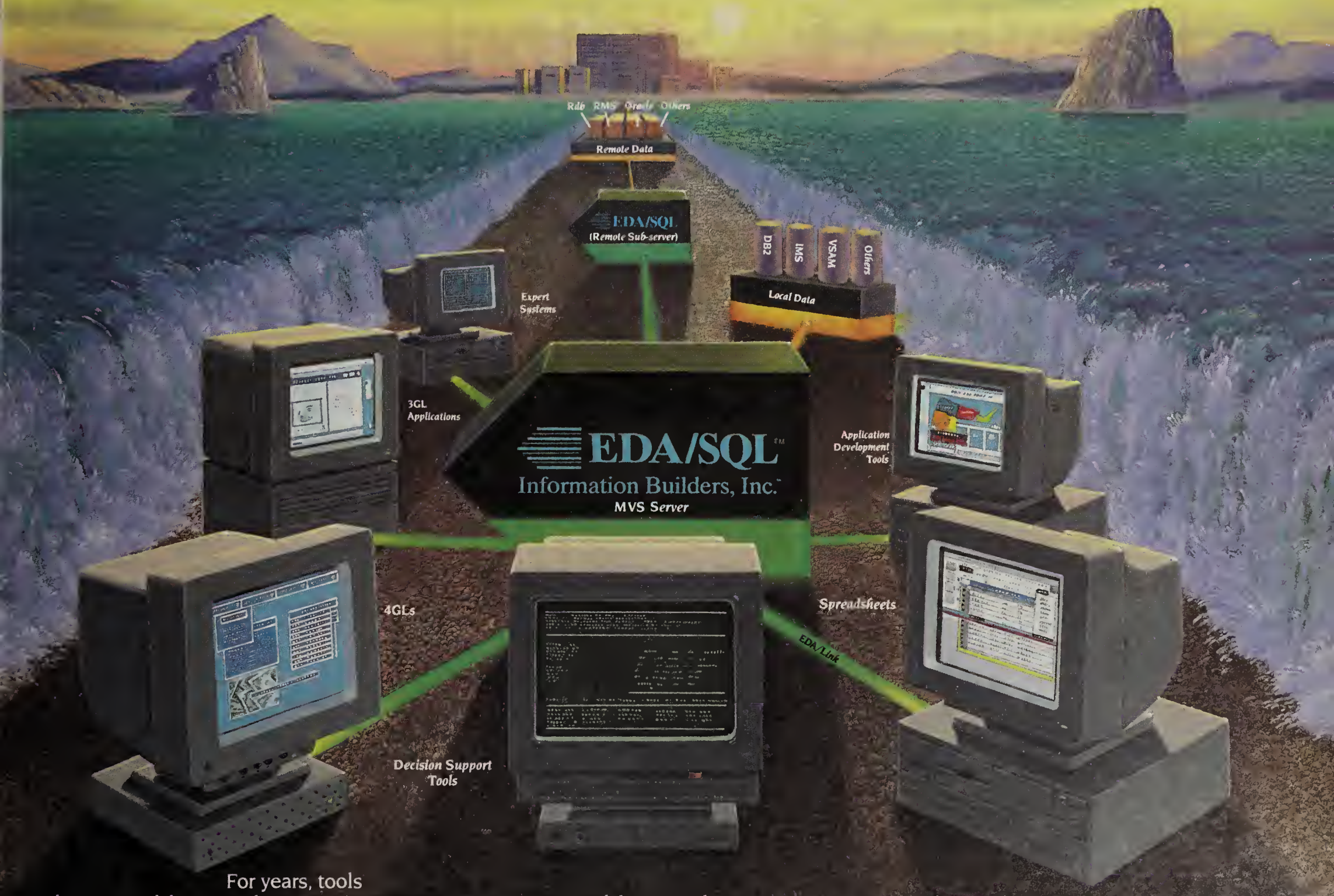


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# Demand creates chip shortage

BY J. A. SAVAGE
CW STAFF

Unexpected demand for Hewlett-Packard Co.'s HP 9000 Series 700 workstations has created a backlog for the systems because a chip maker has been unable to keep pace. Texas Instruments, Inc. cannot make custom floating point units for HP as fast as it is getting orders.

"The lead time is up to 12 weeks in some cases between order and shipment," an HP spokesman said. He said he hopes that by the end of the year the two will be in sync with supply and demand.

HP projected fairly high demand for the workstations but not high enough. HP revised its requirements and as a result, TI began to use a Japanese fabrication facility, as well as one in Texas, to make more of the chips.

Buyers do not appear terribly upset by the delays. Bernie O'Conner, manager for migration at SAS Institute, Inc. in Cary, N.C., said that he ordered early, and there has been little or no impact. O'Conner is set to have up to 400 of the HP workstations by the end of the year.

One consumer, who asked to remain anonymous, said he was irked at the delay but was mollified a bit when HP sent him a color X Window System.

# PC-generated tax returns obtain IRS approval for '92 filing season

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Next year, taxpayers will be able to use personal computers to compute taxes and print tax returns for filing with the Internal Revenue Service.

The IRS announced recently that it will accept PC-generated "answer sheets" that contain just the lines with data from a particular taxpayer's form 1040 and supporting schedules. Tax data will be printed in three columns on plain paper, and most filers will be able to print their entire return on one page, the IRS said.

The IRS has provided specifications for the filing method to a number of private software developers, and it said it will test their products for accuracy. Several commercial offerings should be available in time for the 1992 filing season, the agency said.

The filing option, called 1040PC, was tested this year at the IRS' Memphis Service Center, where 39,000 of the automated returns were processed. The IRS said 1040PCs were filed by taxpayers and processed by the IRS with fewer errors than with traditional forms.

The IRS also announced it will test Telefile, an option by which filers can call a toll-free number and enter all tax-return information through a Touch-Tone telephone. The IRS will compute the tax and any refund or tax due while the filer is on the phone. Telefile will be offered initially to 1.2 million unmarried Ohio taxpayers with incomes below $50,000.

# Windows

CONTINUED FROM PAGE 39

Corp. Meanwhile, firms such as Power Up Software Corp. in San Mateo, Calif., have focused on easy-to-use packages that can be used to gain inexpensive entry to the Windows desktop publishing market.

Many opt for the simplified products because they do not need all the functional gingerbread. "A secretary using only one-third of a product's function doesn't need a full-featured $500 database when a $70 version will still get the job done," Strong said. Prime targets include small businesses, support staff and executives who take work home, Julien added.

In August, Borland began offering entry-level versions of its flagship Quattro Pro spreadsheet and Paradox database. Both are similar to their full-blown counterparts but delete high-end features such as the interactive what-you-see-is-what-you-get display and the Paradox Application Language. "We've learned that every one of our products does not have to be a glory product in order to satisfy a need," said Rob Dickerson, general manager at Borland's database business unit.

Both Borland applications cost much less than their full-featured counterparts: $69.95 for the Quattro Pro Special Edition (SE) and $99.95 for Paradox SE. The high-end Quattro Pro 3.0 now retails for about $495; Paradox sells for $795.

In recent weeks, Microsoft has released three low-cost packages: Microsoft Works for Windows (a $199 package that includes a word processor, spreadsheet, database and charting function) as well as separate low-end publishing and finance packages.

Besides adding a short-term revenue boost, the low-end additions can secure the entry-level customers that may one day need the full-featured products. "We're looking for the customer who is shopping around for their first spreadsheet or database," Borland spokeswoman Catherine Miller said.


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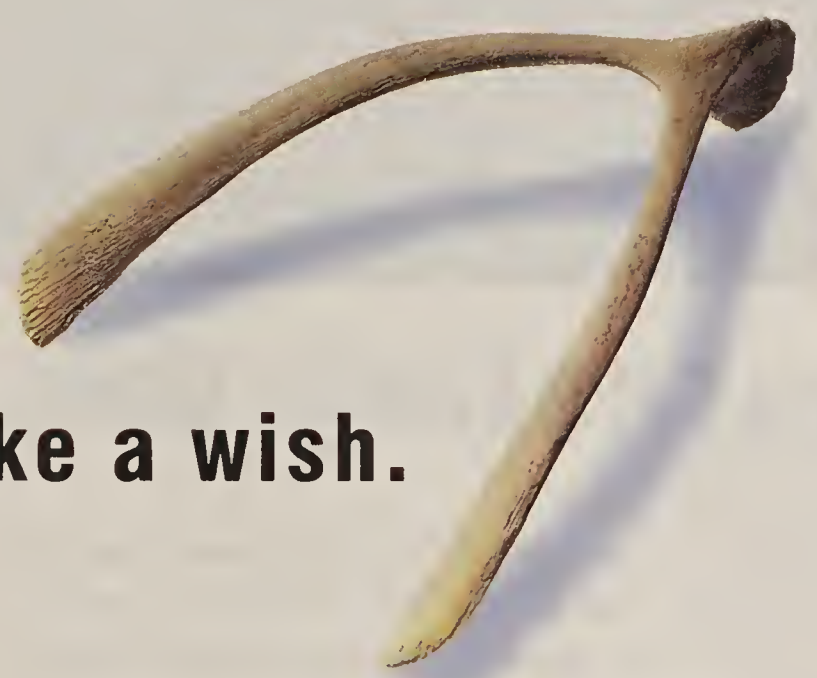

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# Seybold: Tech binge for product-hungry

BY JAMES DALY
CW STAFF

SAN JOSE, Calif. — Desktop publishers starved for products feasted on the technological victuals of hundreds of companies two weeks ago as the Seybold Computer Publishing Conference & Exposition served up everything from pen-based applications to laser printers.

Among the products unveiled at the three-day show were the following:

• Slate Corp. announced Penbook, electronic book software for pen computers that allows users to take documents created with Adobe Systems, Inc.'s Postscript and publish them on a pen-based computer. The package consists of Penbook Author, which translates and stores documents, and Penbook Reader, which enables the users to read Penbook documents. Penbook will be available in the second quarter of 1992. Penbook Author will cost $695, while Penbook Reader will retail for $99, according to officials at the Scottsdale, Ariz., company.

• Caere Corp. announced Typist Plus Graphics, a handheld scanner for IBM Personal Computers and compatibles that combines advanced optical character recognition (OCR) technology with image scanning and editing capabilities. Typist Plus Graphics reads both text and graphics and costs $595.

The Los Gatos, Calif.-based company also announced Omnipage Professional for the Macintosh, an OCR software package that includes full support for Apple Computer, Inc.'s System 7.0. It will be available in the fourth quarter for $995. Omnipage customers may receive a software upgrade to Omnipage Professional for $150.

• Seattle-based Aldus Corp. announced Aldus Freehand 3.0 for Windows as well as Freehand 3.1 for the Apple Macintosh, which takes advantage of the features of System 7.0. Both cost $595 and will be available by the end of the year.

Aldus also said it has acquired the rights to Pageahead Software Corp.'s Pageahead, a bridge between database management systems and Aldus Pagemaker. The combination will enable Pagemaker customers to query, retrieve and format data from Dbase and ASCII files and place it in publications produced by Pagemaker. The Pagemaker Database edition ($995) is expected to ship by year's end.

• Xerox Imaging Systems, Inc. introduced Accutext 3.0, its newest version of its intelligent character recognition software for the Macintosh.

The application allows users to more accurately process a wider variety of documents, including those degraded by time or misuse. Accutext 3.0 is priced at $995; current Accutext users can upgrade for $150.

• Adobe demonstrated Carousel, a document interchange format that will allow users to transmit documents across a wide variety of hardware and operating system platforms without font degradation. The format is expected next year.

• Philadelphia-based Bell Atlantic Corp. unveiled a newly enhanced Docusource information management system, which converts print-based documents into interactive electronic libraries. Additions include a conversion function that can bring various types of source documents into the Docusource system. The basic Docusource Librarian system is priced at $4,195, while a component system excluding the autoconversion feature costs $1,395.

# Microsoft, SCO give first look at ACE operating systems

BY J. A. SAVAGE
CW STAFF

Allowing a peek at the first substantive software from the Advanced Computing Environment (ACE) consortium, Microsoft Corp. and The Santa Cruz Operation (SCO) recently previewed their new operating systems on prototype computers based on Mips Computer Systems, Inc.'s next-generation CPU.

The two firms will offer operating systems for platforms from Intel Corp. and Mips in mid-1992. Applications on Microsoft's operating systems should be able to run across platforms without recompiling. But SCO's will have to be recompiled between platforms. Applications will also have to be operating system-specific.

Microsoft's operating system is set to include DOS, Windows and OS/2 as well as the new operating system called Windows New Technology (NT). It will have the same user interface as Windows 3.0, said Paul Maritz, vice president of advanced operating systems at Microsoft.

One layer of software, called the NT Executive, will sit above either platform. On top of that can be Windows 32, for 32-bit applications. Windows 3.0, also known as Windows 16, will sit above Windows 32 to be run in emulation on Mips-based systems. DOS, too, will run in emulation on Mips-based systems. The latter two should be able to run on the Mips platform in 80386-like speeds in emulation, according to Maritz.

"Our motivation is not to run Unix," said Carl Stork, advanced development business manager at Microsoft. He explained that the company is interested instead in running the same applications across platforms. He envisioned users having several operating systems: DOS for casual users, NT on Intel for the higher end Intel-based computers and NT for Mips on servers and workstations.

While Stork said that OS/2 will coexist with NT, "once we ship NT, we will suggest using it instead."

SCO aims more at traditional Unix applications, as well as furthering interoperability with other platforms. "Our strength is in the Unix world with its robustness," said Mark Yahiro, product marketing manager for SCO.

The Open Software Foundation's Motif graphical user interface is incorporated into Open Desktop for Mips, and so are networking services such as support for Microsoft's LAN Manager, Sun Microsystems, Inc.'s Open Network Computing and Transmission Control Protocol/Internet Protocol. Scott McGregor, senior vice president and general manager at SCO's distributed computing division, said SCO's plan is to interoperate with ACE platforms as well as others, thus the emphasis on networking.

In the ACE arena, users will have the option of RISC/OS, Mips' operating system.

# RISC chip packs punch

Mips Computer Systems, Inc. previewed its next-generation reduced instruction set computing (RISC) processor recently. While the chip is initially set to run at 50 MHz, scaling up to 100 MHz, its potential benchmark ratings are not as high as what is currently available from Hewlett-Packard Co.

The CPU will be the basis of high-end hardware in the Advanced Computing Environment consortium. CPUs from Intel provide lower end platforms. Operating systems are being developed for those CPUs that will allow applications to run across both platforms.

The CPU, called the R4000, is set to be available in mid-1992, and systems based on the CPU will be available immediately thereafter from Silicon Graphics, Inc., according to a spokeswoman for the company. Systems from Mips will take a bit longer, between the first and second quarter of 1993, a Mips spokeswoman said. In all, R4000-based systems will be available from more than 70 vendors, including Acer America Corp. and Zenith Data Systems.

The processor will have three variations. A low-end CPU, the R4000PC, was rated in a simulation at about 40 Specmarks using the Systems Performance Evaluation Council tests for workstations. At the high end, the R4000SC and the R4000MC, a multiprocessing chip, are expected to run at about 60 Specmarks. In comparison, HP's high-end CPU, called PA-RISC, is clocked at 72.2 Specmarks.

J. A. SAVAGE

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## Software utilities

Vision Systems, Inc. has released ASCII Express, a text editing program for personal computers running DOS.

The program uses pull-down menus and provides features such as a form merge processor, tab and margin settings and a find-and-replace function.

ASCII Express is priced at $169.95. Including a dictionary/spell checker, the product costs $189.95.

**Vision Systems**
**502 Bloomfield Ave.**
**Bloomfield, Conn. 06002**
**(203) 247-4747**

## Systems

NEC Technologies, Inc. has introduced the Ultralite III notebook computer.

The Ultralite III is based on the 20-MHz Intel Corp. 80386SX chip and weighs 4.8 pounds. It includes a 60M-byte hard drive and a 640-by 480-pixel display with 32 shades of gray.

The system costs $3,699. A docking station is available for $999.

**NEC Technologies**
**1414 Massachusetts Ave.**
**Boxboro, Mass. 01719**
**(508) 264-8000**

AST Research, Inc. has announced the Medallion computer-aided design product series, designed in conjuction with Calcomp, Inc.

The first workstation in the integrated series includes a 33-MHz Intel Corp. I486 processor, a 120M-byte hard disk drive, 8M bytes of random-access memory and a math coprocessor. In addition, the machine features a Calcomp high-resolution monitor and graphics controller.

The workstation is priced at $8,995.

**AST Research**
**16215 Alton Pkwy.**
**Irvine, Calif. 92713**
**(714) 727-4141**

## Macintosh products

Harris Laboratories, Inc. has announced an accelerator board for Apple Computer, Inc. Macintosh Classic systems.

The Classic Performer is based on the 16-MHz Motorola, Inc. 68000 processor. It increases the performance of the Macintosh Classic by as much as 96%, according to the company. A slot for a math coprocessor is included.

The product costs $299.95. A coprocessor is available for $149.95.

**Harris Laboratories**
**7379C Washington Ave. South**
**Edina, Minn. 55439**
**(612) 941-3515**

Caere Corp. has announced Omnipage Professional, designed for use with the Apple Computer, Inc. Macintosh.

Omnipage Professional is an optical character recognition software package compatible with Apple's System 7.0. It includes gray-scale editing and text editing as well as improved recognition accuracy. The product can also input text directly into Macintosh applications.

Pricing is set at $995. Upgrades from previous Omnipage versions cost $150.

**Caere**
**100 Cooper Court**
**Los Gatos, Calif. 95030**
**(408) 395-7000**

## Database management systems

Clarion Software Corp. has upgraded its Professional Developer database management and development tool.

Version 3.0 generates highly optimized code, the company reported. It also accesses a variety of database file formats and includes visual templates and embedded source code for building database applications.

The Professional Developer is priced at $995.

**Clarion Software**
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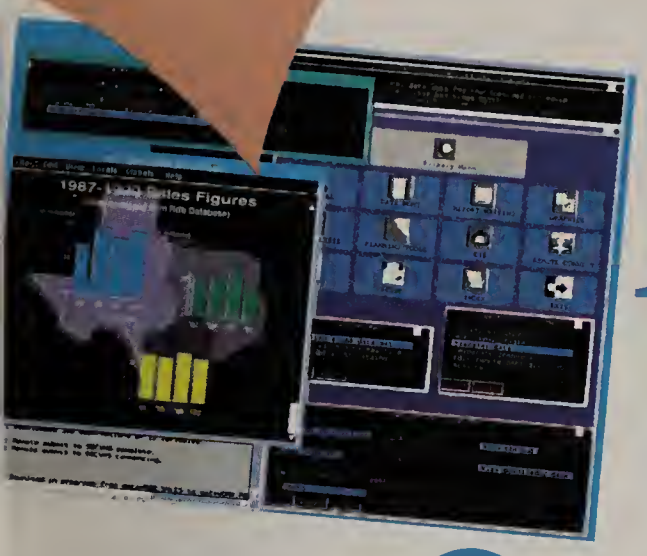

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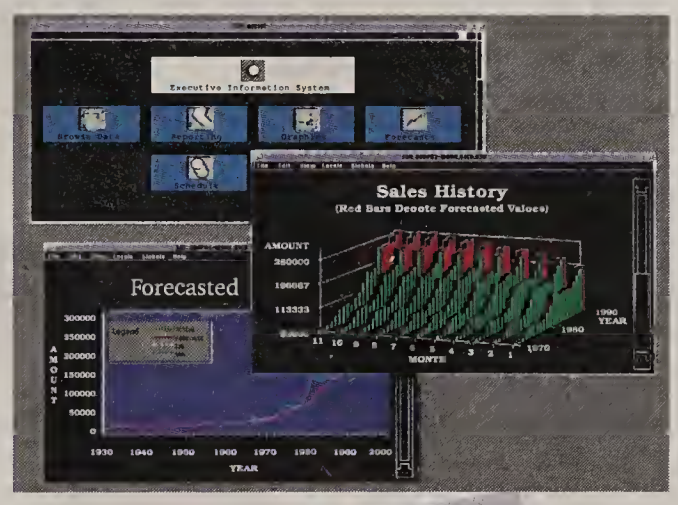


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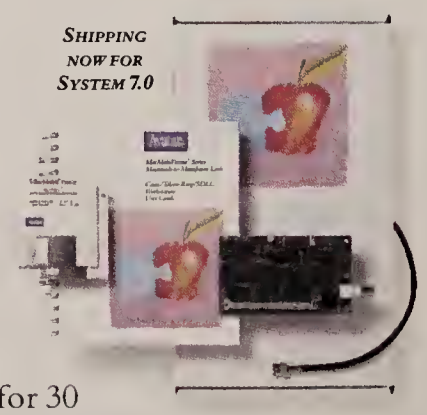


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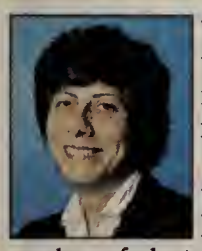
COMMENTARY

*Elisabeth Horwitt*

# Carriers in glass houses



There is such a thing as tempting the gods too far.

The day after AT&T's Manhattan network snafu last month, MCI took out an expensive full-page ad in *The New York Times* that said, in effect, while AT&T was spending money advertising how reliable it is, MCI was spending its money on providing that reliability. Both Sprint and MCI have really spread themselves with a series of ads whose messages all come down to, "Don't risk your business communications over AT&T; play it safe and use us instead."

It's no surprise that AT&T's rivals would take this tack or that all the major dailies hammered the carrier for the human and technical glitches that resulted in the outage. After all, this is the third major outage AT&T and its customers have suffered in about two years.

However, MCI's and Sprint's boasting may well come back to haunt them if either of their networks suffers a similar outage in the not-too-distant future. And that is very possible.

Neither MCI nor Sprint has an intrinsically more reliable or redundant network, a better trained staff or more advanced

*Continued on page 60*

# FCC calls on users for regulatory input

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — When the Federal Communications Commission held a closed-door meeting three weeks ago to discuss what to do about recent telephone outages, telecommunications users were prominently represented. Their views were also reflected in FCC proposals last month to make carriers more accountable during outages.

That kind of user participation would have been unlikely just a few years ago, according to longtime observers of the FCC.

Users are giving the FCC A's and B's for its accessibility and its pro-consumer philosophy, but they also give it an "incomplete" on other issues, especially those affecting the openness and quality of the public networks.

Recent visitors to the FCC said it is more open to user influence than at any time in its 57-year history.

Stanley Welland, telecommunications manager at General Electric Co., said the FCC has changed in the six years he has been at the company, and so have user perceptions of it. "We thought it was a bureaucracy. We thought it didn't care to hear from us," he said. But Welland said he learned that the FCC talks to users and listens to them as well.

Welland said users — both as individuals and as user groups — went to the commission in unprecedented numbers recently to argue for loosened regulation of AT&T. On Aug. 1, the payoff came in FCC decisions that ease restrictions on AT&T's provision of high-end business ser-

*Continued on page 65*

### On the table

**Important matters now before the FCC:**

- Rules for granting independent carriers access to local telephone networks for private-line service.
- Possible further deregulation of AT&T.
- The legality of Tariff 12, discounted packages of services to large users.
- Possible investigation of network upgrade plans of telephone companies.
- User concerns of network quality under price-caps regulation.

CW Chart: Janell Genovese

# Study says security moves to forefront

BY JOANIE M. WEXLER
CW STAFF

DELRAN, N.J. — Network security is getting nearly as much attention these days as the guarding of data in high-end computers, according to survey results just released by Datapro Information Services Group.

Of 1,100 data communications professionals polled by the research firm, based here, two-thirds expressed a high degree of concern about network security — a figure nearly equal to the number expressing concern for system breaches.

Password exposures and computer viruses ranked third and fourth on respondents' lists of network Achilles' heels, after power and communications losses. Password exposure was suffered by 28%, and 22% said they had experienced viruses.

Datapro product manager Jerry Arcuri said he was "surprised" to see that more than half the companies polled had security policies in place, most relating to disaster recovery and preventing employees from removing proprietary information.

### In balance

However, one user noted that his company strives for a balance between guarding information and empowering users with access to corporate data.

"Network security is like [guarding against] shoplifting," said Bill Sheehan, a technical support specialist at Stone & Webster Engineering Corp., an international firm based in Boston. "You can put a lock on the front door and nothing will get stolen — but nobody will buy anything, either. You don't want to defeat the purpose of the network by locking it up too tight."

Sheehan, who said his firm has strict policies against copying software — a major entry point for viruses — has led classes to educate employees about security. Seventy-five percent of the Datapro respondents rated employee education as a high-priority security measure; 80% said that network access controls were just as important.

Users said antivirus software and security features built into network operating systems were integral to their security procedures. Sheehan runs about 1,800 nodes of Banyan Systems, Inc. Vines software, which he said is "airtight" when it comes to security.

The manager of information technology at Children's Hospital in Pittsburgh said that in addition to the bilevel password protection that comes bundled into his Novell, Inc. Netware software, remote access to the hospital's database is patrolled by a dial-back modem that accepts a password and then calls the user back. About 60% of Datapro respondents said they use this type of security, while only about 25% said they use encryption.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# Monitor tracks, tests networks

BY KIM S. NASH
CW STAFF

HUNTINGTON BEACH, Calif. — Touchstone Software Corp. recently started shipping a combination inventory monitor/network diagnostic package for users of Netware 286 from Novell, Inc. Check It LAN was designed to track and test all the software and hardware on a local-area network.

Products from Touchstone's rivals Brightworks Development, Inc. and Horizons Technology, Inc. can inventory LAN equipment but do not perform diagnostics, said Shannon Jenkins, Touchstone's president and chief executive office.

In seven minutes per node, the software package can check the memory, communications ports, all functions on the motherboard and both floppy and hard disks on a LAN, Jenkins said. Along with keeping a database of the number and location of cards, drivers, CPUs, amount of memory, application and system software installed on the network, the software runs prescheduled tests for performance and virus troubles.

Check It LAN reportedly alerts network managers via dial-out line when problems occur, such as when user-defined network performance thresholds are exceeded; when the scan finds a virus; or when a node failure shows up. The manager can port the test results, along with other network data, to other applications for analysis. A single module can monitor a LAN of up to 20 nodes.

Touchstone touts Check It LAN's help with version control, which may head off potential licensing problems. Check It LAN runs on IBM Personal Computers and compatibles and is available in a starter-kit five-node version for $195 or a 20-node edition for $395.

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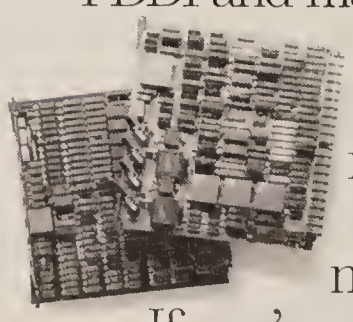

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# Horwitt

CONTINUED FROM PAGE 59

network management technology than AT&T does. They are just statistically less likely to suffer a major outage because they have much smaller networks that handle a lot less traffic.

The Federal Communications Commission's recently published report on long-distance carrier market share found that AT&T's share has slipped from 63.2% in the first quarter of this year to 61.8% in the second. Combined, MCI and Sprint handle less than 40% of the country's long-distance traffic.

The No. 2 and No. 3 carriers also have a lot less cable and switching facilities than AT&T does. This is why they have been ahead of No. 1 in terms of updating their switches from analog to digital and installing fiber-optic backbones. Of course, this means their networks are probably more consistently high-tech than AT&T's — even though AT&T has spent billions of dollars to upgrade its systems and claims to have more backup and diversity than anyone in the industry.

I am willing to bet, however, that even if it still operates some aging central offices in, say, Vermont, AT&T has put some of its millions into ensuring that crucial business areas — such as downtown Manhattan — have the latest in network technology and backup systems.

That is the nub of the thing: No matter how high-tech and reliable you may be, you cannot control all the factors. And the bigger your system is, the more likely it is that something unforeseen or uncontrollable will go wrong. Like a backhoe hitting a fiber-optic cable. Or an audible alarm not being audible enough.

All the carriers are in the process of implementing computer-based systems to automatically react to problems — which means cutting back on human staff. There may be some validity to the allegation that AT&T has cut more staff than is optimal for reliability. The carriers are still trying to strike the right balance of human judgment, computer technology and budgetary pressures.

The telecommunications services industry is going through an incredibly rapid transition to new technologies and new methods of operating. By far the biggest carrier in the business, AT&T is naturally on the bleeding edge and likely to take a few hits as a result. As AT&T is learning the hard way, this means it must work much harder than its competitors to safeguard against disaster.

However, given the impossibility of controlling all factors, AT&T must also work with its customers to find new and better ways to minimize the impact of a potential outage. Last January's fiber-optic break painfully taught more than one business that its backup facilities were not sufficient to handle a major network failure. AT&T has since worked with many companies to ensure that even if its network goes down, theirs will not. And indeed, most New York businesses fared well during last month's snafu, recovering their networks in seconds.

Perhaps we are on the brink of an era of totally reliable telecommunications services. Until then, however, we should all remember that nothing and no one is perfect and act accordingly.

Horwitt is a *Computerworld* senior editor, networking.

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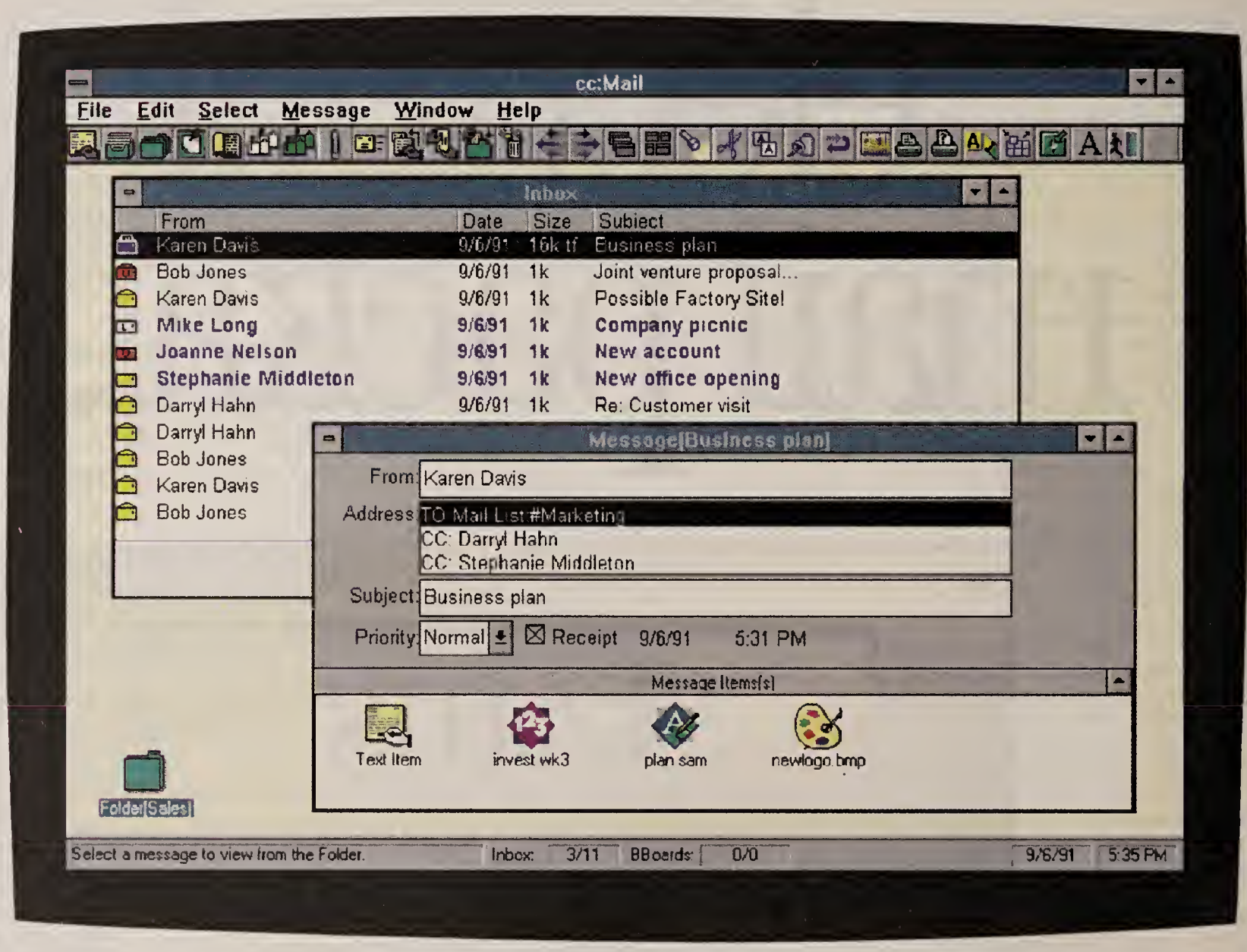


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PC WEEK 10/22/90

*"Lotus' cc:Mail for DOS 3.2 and its Windows version 1.0 offer everything you need in messaging mail management and connectivity. Intelligent menu organization makes both DOS and Windows versions a breeze to learn and use. It's clearly a best buy."*
PC WORLD 9/91

# cc:Mail from Lotus

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# E-mail net prescribed for doctors in Africa

BY MITCH BETTS
CW STAFF

Beginning this month, doctors in Africa will be able to consult with peers throughout the world and obtain medical literature using a "packet satellite" network managed by Satellife, a not-for-profit organization based in Cambridge, Mass.

The electronic mail network is intended to fill the urgent need for the latest medical information in the developing world, which suffers from "information poverty," according to Charles Clements, executive director of Satellife. For example, the medical library at Uganda's Makerere University cannot afford subscriptions to any medical journals requiring payment in foreign currency.

The network involves a small, low-orbit satellite called Healthsat, which signals ground stations in its path. The ground stations — personal computers linked to amateur radios — send back recognition signals and then upload outbound messages.

The messages wait in Healthsat's on-board computer until it passes over the recipient's ground station, when the message is downloaded and read as E-mail.

The radio transmissions run at a speed of 9.6K bit/sec., according to Jon Metzger, Satellife's associate director of operations. He said the ground stations use an IBM-compatible microcomputer with a math coprocessor, which tracks the satellite and tunes the radio frequency.

The ground stations involved in this pilot project are located at Makerere University, the University of Dar es Salaam in Tanzania, the University of Zambia, the University of Nairobi in Kenya and the University of Zimbabwe. Health professionals in the U.S. and Canada can participate in the E-mail network via the North American gateway at Memorial University in St. John's, Newfoundland.

The satellite network is needed because communications by

**Satellife's Clements** *looks to control 'information poverty'*

telephone and fax machines is rarely affordable or reliable in the developing world, Satellife officials said. They noted that it costs $7 per minute to call from Lusaka, Zambia, to London, and it costs $7 to fax a single page from Nairobi to Geneva.

Satellife is an initiative of the International Physicians for the Prevention of Nuclear War organization, recipient of the 1985 Nobel Peace Prize.

Healthsat has an on-board memory capacity of 10M bytes and could support about 500 ground stations. Anticipating greater needs, the Satellife board has authorized the manufacture and launch of a second satellite by 1994.

INTERNATIONAL SHORTS

## NT wins Mexico contract

**Telefonos de Mexico** has awarded a $21 milllion contract to **Northern Telecom, Inc.** for switching equipment to update the Mexican carrier's network.

**AT&T** and Brazilian network equipment provider **Moddata S.A.** have signed a joint agreement to provide global, public electronic mail services to Brazil. Under the agreement with AT&T Easylink Services, Moddata becomes the first company to provide customers in Brazil with local access to AT&T's international E-mail services. Moddata will also act as marketing representative in that country for AT&T's international private line services.

**STC Submarine Systems,** a **Northern Telecom** subsidiary, has been awarded a $65 million contract to supply the first international undersea fiber-optic cable connection to the USSR. The cable will run under the Baltic Sea to connect Copenhagen and Kingisepp near St. Petersburg in Russia. The link will support data, video and voice services and will be the first section of a proposed trans-USSR cable system that will run east to west across the entire USSR, Northern Telecom said. Completion is slated for February 1993.

# FCC calls

FROM PAGE 59

vices, which users said will stimulate competition and lead to lower prices as well as more and better services [CW, Aug. 5].

"This time, they really did talk to not only carriers and lawyers but to customers, and they came to a number of excellent conclusions. I spoke to [FCC Chairman Alfred C. Sikes]. He appreciated the fact that we were there;" Welland said.

Communications lawyers who represent users generally support Welland's assessment. "It used to be harder to get in the door if you were a Citibank than if you were an MCI because the agency perceived its constituency as those in the industry, not those industry served," said Henry D. Levine, a Washington, D.C., attorney who represents a number of financial institutions.

Sikes said he strongly supports the approach taken by General Electric and other activist users and user groups. "It's important for users to understand that providers spend a lot of time encouraging commissioners and their staffs to do one thing or another," he said in a recent interview.

Sikes said he welcomes views that come directly from users rather than through user groups.

### Clear views

The chairman makes no attempt to hide his beliefs. In a nutshell, Sikes wants more competition, less regulation and just enough safeguards to prevent abuses of market power. Among his views are the following:

- "Users define markets. They can define markets a lot better than government can."
- "I believe strongly in pluralistic markets. In order to . . . dramatically enhance user options, we've got to have very few entry barriers."
- "It's important that we be friendly to innovative products delivered by big and little companies . . . [but] at the same time that we don't hesitate to call for safeguards so [the big companies] don't suffocate the small companies."
- "We have got to guard against policies that move away from cost-based pricing. It's much better to identify subsidies and do it in an understandable way than to embed them or hide them so that prices get distorted and no one knows exactly why."

Recent FCC actions suggest Sikes means what he says. Just this year, the commission has moved to increase competition in the long-distance marketplace by substantially deregulating AT&T. The move has stimulated competition in local markets by requiring local telephone companies to allow competitors to connect to their local exchanges.

While it would be hard to find users who do not embrace Sikes' broad philosophies, some have problems with the way the present commission has sought to implement them.

"Service quality is the single biggest issue for users and one I don't think the FCC has dealt with effectively," said former FCC Chairman Richard E. Wiley, who now represents both telecommunications users and providers in a private Washington, D.C., law practice.

Wiley faulted the commission's decision a year ago to scrap rate-of-return regulation for local telephone companies in favor of a price-caps scheme. The FCC said price caps would drive down prices by offering profit incentives for becoming more efficient, but users worried that carriers would sacrifice service quality.

William Hider, telecommunications vice president at Gannett Co., agreed that users are concerned about possible declines in service quality as a result of price-cap regulation.

"We think we're seeing that already. The level of responsiveness is not as good as it used to be," Hider said. He added that Gannett is taking its concerns to the FCC through a newspaper industry association and via the International Communications Association, a user group.

Influencing the FCC is "an uphill battle," but it can be done, said P. Michael Nugent, a vice president and attorney at Citicorp. For example, he said, information services providers working through associations succeeded in persuading the FCC to withdraw a 1987 proposal to impose "access charges" for connecting the providers to local exchange networks, charges likely to be passed on to users.

Brian Moir, counsel for the International Communications Association, said it is ironic that at a time when users have unprecedented leverage with the FCC, downsizing and budget cuts in their own organizations leave them with fewer resources to devote to lobbying.

### Time is of the essence

Nugent agreed that active participation in regulatory processes is not easy for most users today. "These are difficult issues, and users don't have the time to spend on them any more than they do on electrical rate cases. Unfortunately, a lot of users see them as electrical rate cases; they don't see telecommunications as a competitive strategic resource."

James S. Blaszak, counsel for the Ad Hoc Telecommunications Users Committee, urged users to join the Coalition of Open Network Architecture Parties, which has petitioned the FCC to investigate the regional telephone companies' current plans for upgrading their networks to ensure that the next generation is open and flexible to accommodate new services.

"This effort challenges users to view involvement in the regulatory process as a strategic enterprise," Blaszak said. "Users need to understand that influencing the FCC may not produce a payback this quarter or this year but into the 21st century."

## That was then, this is now

The FCC's current regulatory philosophy is a product of past commissions, but it has hardly remained constant over the years.

"The FCC has created a policy of competition, going back to my time there," said Washington, D.C., attorney Richard E. Wiley, who was FCC chairman from 1974 to 1977. "Competition isn't even written into the Communications Act of 1934 [which established the FCC]. We made it up, in effect, based on what we thought was in the public interest."

During the 1970s, the commission was active in tearing down barriers to competition, said Brian Moir, counsel for the International Communications Association. "Unfortunately, it went through a period in the postdivestiture 1980s in which it was more sympathetic to monopolies than to captive ratepayers. This commission is working to become more balanced."

According to Moir, the Reagan commissions sought a de facto downsizing of the FCC by deliberately not adopting efficient methods of executing the agency's regulatory duties, a process he called "back-door deregulation." Now, the FCC is still underfunded and understaffed, but it is trying hard to do more with less. "The present commission is giving the staff the tools to do the job. The complaint process is out of control, but whereas earlier commissions didn't care, the current one does and is working to improve it," Moir said.

Wiley agreed that the current commission has not embraced the antiregulation mind-set of the Reagan-era commissions.

GARY H. ANTHES

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*Through the steamy*

*when I realize tha*

*thousands of tourists*

*scare me. All of them*

*All with their own*

*my soapsuds and fear*

*System I had the studio*

*moment I imagine*

*if he's off shooting a*

*Attendant will quickly*

*tickets, directions,*

*concerning the tour. I*

*will speed them on*

*through the steam to*

*company directors*

Automated Attendant answering that can route
Universal City Studios Director of Adminis
system to be just as it is in the movies, take a ho

*shower curtain, I think I see the doorknob slowly turning Norman Bates is only part of my problem. It's the tens of behind him calling Universal City Studios who really clutching telephones in their hot little hands. celluloid hero to seek out. And me standing here in with only the Automated Attendant of the AT&T AUDIX™ install to defend me from such an onslaught. For a King Kong breaking free and rescuing me. Then I wonder sequel. But who needs him anyway? The Automated answer any questions callers might have concerning hours, special events or anything else we care to mention turn off the water, confident that our AUDIX System their way. Reaching for a towel, I furtively look the shadowy corners of the room and wonder if other have problems like mine. I suspect I'm not alone.*

allers with the push of a button is a star attraction of AT&T AUDIX voice processing.
ration Marcia Beilfuss finds it a most entertaining feature. If you'd like your phone
hower and call 1 800 247-1212, Ext. 461. In Canada 1 800 387-6100.

AT&T

# NSA's monitor a lifeline for Netware 2

BY JIM NASH
CW STAFF

LAGUNA HILLS, Calif. — Network Software Associates, Inc. (NSA) tried recently to make it a little more comfortable to stay with Novell, Inc.'s Netware 2. The third-party vendor announced software that monitors Netware file servers and other devices from an IBM Netview management console.

Currently, Novell allows such monitoring only from its high-end Netware 3 network operating system. Some network managers said NSA's product, Network Manager, could be just right for information systems departments that are either staying with Netware 2 or slowly upgrading from Netware 2 to Netware 3.

Using Network Manager, according to a spokesman for the company based here, IS managers at a Netview console will be able to monitor any file services on Netware 2 or Netware 3 that use Internet Packet Exchange and Sequenced Packet Exchange protocols.

The software-only product, which operates only on NSA's AdaptSNA gateway, enables managers to boot and shut off the gateways remotely.

"We certainly have a big stake [in adding functionality to Netware 2] because of the high price of Netware 3," said Bill Lawrence, a networking engineer at the nuclear power-generation department of Southern California Edison in San Clemente, Calif. Lawrence added that the utility could not afford to move all of its lower end Netware 2 networks up to Netware 3.

**Net management moves in**

"This breathes a little more life into Netware 2," Lawrence said. At the same time, the product continues a growing trend — moving network management to the central computer room, from which personal computers were supposed to free end users.

Jonah Giacalone, an information systems officer at Manufacturers Hanover Trust Co. in New York, said that while "any management platform is a good one at this point," he could find only limited use for Network Manager. Looking ahead, he said, he could see that eventually he would need Netview to manage his company's networks.

The bank does not use Netview in any way with its networks, Giacalone explained. "But the line between mainframes and local-area networks is blurring," he said, and products such as Network Manager make that line fuzzier.

NETWORK SHORTS

## Hub-router alliance forms

It was only a matter of time until the limitations of the low-end **Cisco Systems, Inc.** router modules going in various vendors' smart-wiring hubs would spur a whole new integrated hub-router technology in the form of a joint alliance. Cisco and hub leader **Synoptics, Inc.** last week announced that they would jointly develop a computer network system dubbed Rubsystem to merge hefty routing capabilities with hub technology that would all be managed by the Sunnet manager from **Sun Microsystems, Inc.** subsidiary Sunconnect. The announcement came a week after hub player **Ungermann-Bass, Inc.** said it had activated an integrated hub/high-end routing architecture in its Access/One hubs [CW, Sept. 30].

Portable personal computer communications will get a shot in the arm when **Traveling Software, Inc.** releases Laplink Pro today. Laplink Pro will let users do remote file transfers and can be remotely installed. It will also offer a Universal Communications Object to allow PCs to connect despite the hardware between them. Initial pricing will be $150, with the price rising to $170 after Dec. 1. Upgrade costs are $40 for software and documentation or $60 with new serial and parallel cables.

Multiplexer vendor **Network Equipment Technologies, Inc.** (NET) said AT&T has certified two NET interfaces for its Integrated Digital Network Exchange (IDNX) wide-area switch to run with AT&T switched voice and multiplexing services. A direct analog IDNX interface allows the multiplexer to connect to analog applications. The other interface, NET's Primary Rate Card, is a channelized T1 interface supporting voice and data and Integrated Services Digital Network (ISDN) applications using out-of-band signaling on ISDN's intelligent D channel.


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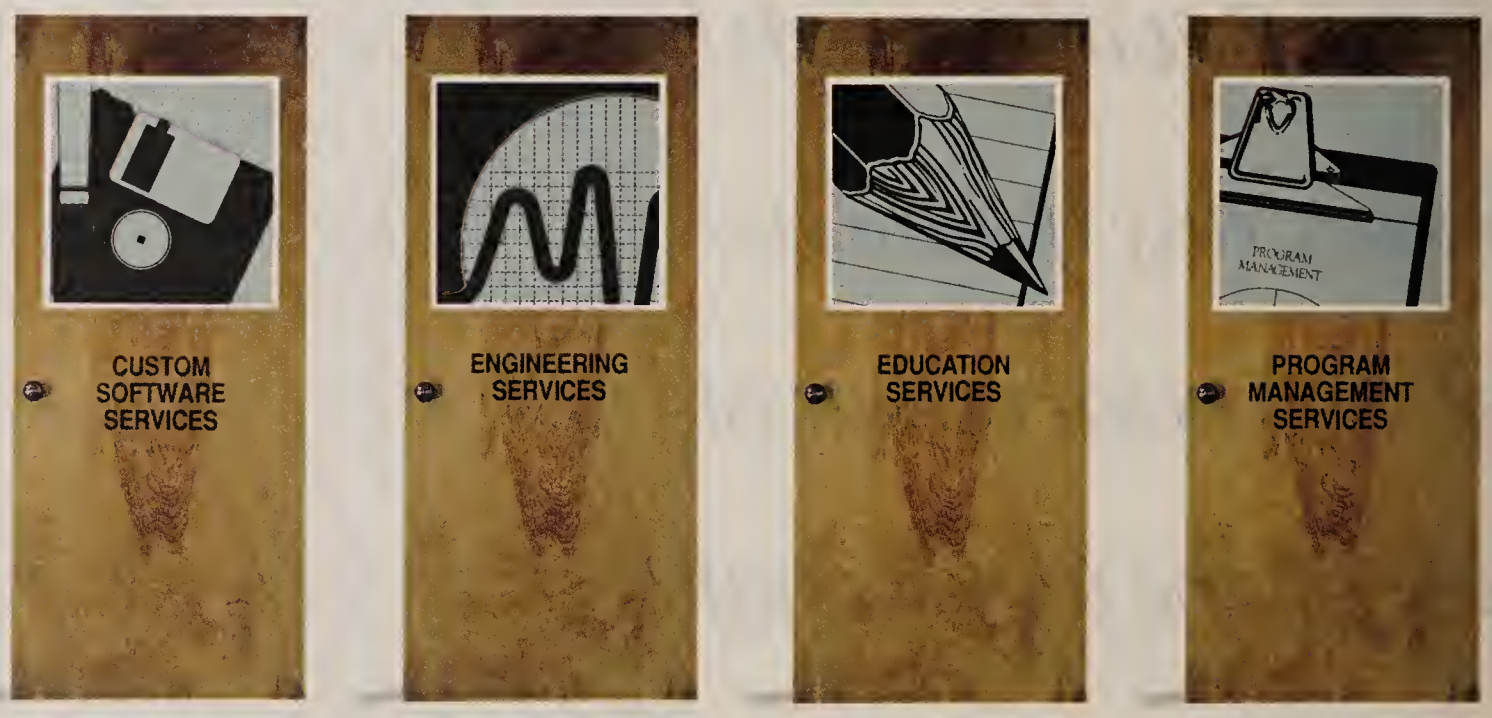


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## NEW PRODUCTS

### Network management

Lanshark Systems, Inc. has released a new utility for use with Banyan Systems, Inc.'s Vines networking software.

Checkpoint allows network administrators to assign disk space limits on groups or individual users.

It includes a reporting element that displays disk use for each node on the network.

Pricing is $695 per server.

**Lanshark Systems**
**3000 Stone Mountain Drive**
**Columbus, Ohio 43147**
**(614) 866-5553**

Baseline Software has created a software package for screening user-selected passwords.

Password Coach performs 39 tests to determine that candidate passwords are sufficiently difficult to guess even by brute-force computer searches. It employs dialog boxes to instruct users how to select appropriate passwords.

Password Coach runs on Novell, Inc. Netware networks and costs $795 to $1,495 per server.

**Baseline Software**
**Suite 1C**
**80 Lincoln Drive**
**Sausalito, Calif. 94965**
**(415) 332-7763**

U-tron Technologies, Inc. has developed Purple CMS, a client management system for local-area network administration.

Purple CMS includes CMS/DOS Server, software that allows users to change their DOS configurations by rebooting their systems and making selections from a menu system.

The product also offers a set of utilities for the LAN administrator that simplifies software upgrades and optimizes Novell, Inc. Netware and DOS network performance.

A starter kit for three client systems costs $495.

**U-tron Technologies**
**47381 Bayside Pkwy.**
**Fremont, Calif. 94538**
**(415) 656-3600**

### Local-area networking hardware

Xircom, Inc. has announced the Pocket Ethernet Adapter II.

The adapter weighs three ounces and includes software and hardware improvements for increased performance. It is bundled with device drivers for most popular network operating systems.

The adapter costs $99.

**Xircom**
**26025 Mureau Road**
**Calabasas, Calif. 91302**
**(818) 878-7600**

Delta Microsystems, Inc. has announced the Gigaguard backup and retrieval system for Unix networks.

Gigaguard incorporates an 8mm tape jukebox with one or two drives and as many as 45 tapes. System storage capacity is up to 225G bytes. Gigaguard runs on a Sun Microsystems, Inc. Sparcstation 2.

List price is up to $110,000, depending on configuration selected.

**Delta Microsystems**
**5039 Preston Ave.**
**Livermore, Calif. 94550**
**(415) 449-6881**

Netframe Systems, Inc. has designed the NF100ES entry-level network server.

The server incorporates an Intel Corp. 80386 chip for system control and up to three additional processors for I/O control. An independent Intel 8088 chip handles remote-control functions. The base configuration includes 8M bytes of memory, an Ethernet or Token Ring connector and 200M bytes of integrated disk space.

Pricing starts at $12,950.

**Netframe Systems**
**1545 Barber Lane**
**Milpitas, Calif. 95035**
**(408) 944-0600**

Gigatrend, Inc. has announced the Dual Serverdat for Netware 386.

Dual Serverdat provides 8G bytes of digital audio tape (DAT) backup-and-restore capacity for Novell, Inc. Netware 386 Version 3.1.

It employs an intelligent tape array controller that simultaneously writes data to two DAT drives. It provides Netware Loadable Module functionality allowing it to be loaded and unloaded from memory while the server is running, the company said.

Pricing starts at $17,750.

**Gigatrend**
**2234 Rutherford Road**
**Carlsbad, Calif. 92008**
**(619) 931-9122**

Allfax, Inc. has announced a suite of network-based products for file, document and fax communications with external environments.

The suite incorporates fax boards, fax server software and a memory-resident component that can be downloaded to an unlimited number of network nodes. The company optionally supplies a reduced instruction set computing server.

Introductory pricing is $999 for a single-board system and $1,495 for a two-board system.

**Allfax**
**Suite 2**
**3772 Plaza Drive**
**Ann Arbor, Mich. 48108**
**(313) 668-7859**


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# MANAGER'S JOURNAL

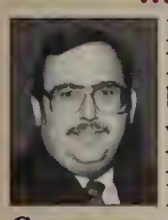
## EXECUTIVE TRACK

**Gary C. Gray** has been promoted to vice president of MIS at **Isuzu Motors America, Inc.** in Whittier, Calif. Gray had been national manager of MIS.

He is responsible for information systems services for Isuzu Motors America, American Isuzu Motors and ICT Corp. as well as data center services for Isuzu Truck of America.

Since joining Isuzu as national manager of MIS from Nissan Motor Corp. in 1988, Gray has doubled the IS staff, from 70 employees to 140. Since then, Isuzu has migrated from a DOS environment to MVS/ESA, replaced an IBM 3090 Model 180 with a Model 300S and established a digital communications link to Isuzu Japan.

Applications developed and implemented during Gray's tenure include parts distribution, warranty, claims and procurement.



**Richard M. Nydick** has been appointed vice president of MIS at **The Hibbert Group**, a national comprehensive marketing services firm in Trenton, N.J.

The most recent position in Nydick's 18-year IS career was director of MIS at Revlon, Inc. He holds a bachelor's degree in mathematics from City University of New York and a master's degree in IS from Polytechnic University in New York.

**John K. Ayre** was appointed vice president of information services at **Solvay America, Inc.** in Houston, the U.S. holding company for Belgian chemical/pharmaceutical manufacturer Solvay SA.

Ayre is responsible for establishing IS policies and strategic IS direction for Solvay companies throughout North America.

He joined Solvay Polymers, Inc. in 1985 and became head of international operations in the information services department of Solvay SA in Brussels in 1988.

# East meets West in the heartland

*Mitsubishi/Chrysler joint venture melds two cultures in IS operation*

BY KIM S. NASH
CW STAFF

"Japanese watch rice grow. We watch sun and rain. We know that for rice to be good, we must wait for natural forces to take effect. But Americans . . ." Shozo Ishida, adviser for information systems at Diamond Star Motors Corp., pauses and squints, searching for the words.

"Americans like Minute Rice," finishes Rex Schemerhorn, IS manager at Diamond Star, the joint venture between Chrysler Corp. and Japan's Mitsubishi Motors Corp.

Tag-team storytelling like this is natural, considering how closely the two men have worked together. In 1987, Ishida came to the U.S. to help Schemerhorn build the start-up firm's brand-new IS operation. Constructing a data center and a manufacturing plant was tough work, especially starting from nothing but 600 acres of overgrown corn fields, smack in the middle of Normal, Ill. (population 39,000).

Such were the roots of Diamond Star, a 5½-year-old carmaker that bills itself as the product of the best in Eastern and Western IS management.

Michael L. Abramson

**Diamond Star's Schemerhorn** *sees results with Mitsubishi's influence on the automaker's IS setup*

Although Mitsubishi and Chrysler are 50-50 partners in the company, Mitsubishi has been the stronger parent, Schemerhorn says. As is customary in Japan, all 3,000 employees, including the 48-member IS staff, wear uniforms. They sport slate-gray pants and maroon shirts, embroidered with their names and the company logo. Also at Mitsubishi's suggestion, the workday officially begins at 7:30 a.m., when music vibrates through the halls and workers are expected to stretch and jump around.

"The clothes and exercise put people on more equal footing," Schemerhorn says. "We operate more like a group than a structured hierarchy."

Along with hot new sports cars — the Mitsubishi Eclipse and Plymouth Laser were named among *Car and Driver*'s 10 Best Cars for 1989 and 1990 — Diamond Star has also built a unique IS operation by melding Japanese and American technology concepts.

Originally, Diamond Star's eight-man board of directors simply wanted to duplicate Mitsubishi's Okazaki, Japan, plant in Normal. Re-creating the manufacturing facility was easy enough: Diamond Star shipped to the U.S. two Mitsubishi Automotive Line Controllers (ALC), which are mainframe-class computers that schedule and track car manufacturing.

But transplanting Mitsubishi's business-side technology did not work. The two countries' finance and accounting practices are too

*Continued on page 76*

# Aerospace CIOs differ on outsourcing

BY CLINTON WILDER
CW STAFF

Is General Dynamics Corp.'s outsourcing of its entire data processing function a sign of things to come in the shrinking, post-Cold War aerospace and defense industry? Two prominent former aerospace chief information officers expressed very different opinions when asked that question recently.

John Hammitt, the recently departed information systems chief at United Technologies Corp. in Hartford, Conn., called it "a bold step" that industry CIOs should watch closely. But W. Richard Howard, the former CIO at Northrop Corp. in Los Angeles, said General Dynamics' situation is unique and cannot necessarily be applied to other defense firms.

The two opinions typify the widely varied reactions that major outsourcing deals have elicited from the IS community. General Dynamics' 10-year contract with Computer Sciences Corp. (CSC) is the most extensive deal so far, transferring 2,600 IS employees to the vendor in order to provide soup-to-nuts IS services, including applications development, network management and operations.

"It took a certain amount of courage and innovative risk-taking on their part, and I think we need more of that in this business," Hammitt said. "They are rethinking the way IS serves the business, deciding to buy it rather than keep it and cut costs. Time will tell if it's successful, but I think the IS profession needs to face the reality of competition."

General Dynamics will gain immediate balance sheet benefits by converting its data center assets to cash, but the real success yardstick will be whether CSC can deliver high business value — something that General Dynamics' internal IS organization had won high marks for doing.

"It is hard to imagine an industry more dependent on IS than aerospace and defense," Hammitt said. "If it is all strategic, it ought to be strategic in a business like this. Can [outsourced IS] cut time to market, improve customer satisfaction, improve product quality or help re-engineer the business? That's the real test."

Howard, now a managing director at search firm Korn/Ferry International in Los Angeles, said Northrop considered outsourcing during his tenure but decided instead to cut costs with major data center consolidations. Even in a recession and shrinking market, companies that are running lean should have little to gain by looking outside, he said.

"Once we did what we called 'insourcing' at Northrop, there wasn't that much money left," Howard said. "If you have really consolidated and you have the critical mass to support the organization, you should be able to compete with the outsourcing vendors."

## CALENDAR

The next conference devoted to the outsourcing decision is Digital Consulting, Inc.'s "The Outsourcing Conference," to be held Dec. 3-4 at the Newton Marriott in Newton, Mass. Chaired by Meta Group, Inc. President Dale Kutnick, the conference covers several aspects of outsourcing data center operations, network management and applications development. It also features a case study by Fred Cisewski, senior vice president of MIS at Bank South NA in Atlanta.

For information or to register, contact Digital Consulting in Andover, Mass., at (508) 470-3880.

### NOV. 3-9

**User Services Conference.** Seattle, Nov. 3-6 — Contact: Sheryl Burgstahler, University of Washington, Seattle, Wash. (206) 543-0622.

**Aspenworld '91.** Cambridge, Mass., Nov. 3-6 — Contact: Aspen Technology, Inc., Cambridge, Mass. (617) 497-9010.

**Decisian Support and Executive information Systems: A Monagerial Perspective.** Cambridge, Mass., Nov. 4-5 — Contact: Decision Support Technology, Inc., Cambridge, Mass. (617) 354-6400.

**Assaciation for Services Monagement (AFSM) internationol's Eighth Annual Seniar Executive Conference.** Edinburgh, Nov. 4-6 — Contact: AFSM International, Fort Myers, Fla. (813) 275-7887.

**infotech Monagement Conference & Expasitian.** New Orleans, Nov. 4-6 — Contact: Data Processing Management Association, Park Ridge, Ill. (708) 825-8124.

**Voice '91/Foli.** New York, Nov. 4-7 — Contact: Voice '91/Fall, Houston, Texas (713) 974-6637.

**Downsizing/Rightsizing Corporate Computing.** Washington, D.C., Nov. 4-7 — Contact: Todd Langton, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

**C-Forum '91.** Boston, Nov. 4-8 — Contact: The Wang Institute of Boston University, Tyngsboro, Mass. (508) 649-9731.

**Texas Arc/Infa User Graup.** Denton, Texas, Nov. 4-8 — Contact: Scott Sires, Texas Arc/Info User Group, Denton, Texas (512) 475-0334.

**Entity Modeiing: Techniques and Applicatians.** Houston, Nov. 4-8 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

**The Moc Shaw.** King of Prussia, Pa., Nov. 5-6 — Contact: Ad-Libs Advertising, Dresher, Pa. (215) 540-9111.

**Scon Tech '91.** Dallas, Nov. 5-7 — Contact: Automatic Identification Manufacturers USA, Pittsburgh, Pa. (412) 963-8588.

**Broadband Networks.** Washington, D.C., Nov. 5-8 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

**Canadian infarmotian & image Management.** Toronto, Nov. 6-7 — Contact: World Access Corp., Wellesley Hills, Mass. (617) 235-8095.

**Faurth Annual Micrapracessar Farum.** Burlingame, Calif., Nov. 6-7 — Contact: Microprocessor Forum, Berkeley, Calif. (510) 549-4300.

**DB2 Detail Conference.** New York, Nov. 6-7 — Contact: George Coronado, DB2 & SQL Users Group, New York, N.Y. (212) 866-7563.

**Landex '91.** Atlantic City, Nov. 7-9 — Contact: Local-area Network Dealers Association, Elmhurst, Ill. (708) 279-2255.

### NOV. 10-16

**Managing Apple Computers in infarmatian Systems.** Phoenix, Nov. 10-13 — Contact: Managing Apple Computers in Information Systems, Chicago, Ill. (312) 644-6610.

**The Eost-West High-Tech Farum.** Warsaw, Nov. 10-13 — Contact: Edventure Holdings, Inc., New York, N.Y. (212) 832-1720.

**American institute af Certified Public Accauntants (AICPA) Software Users' Conference.** Orlando, Fla., Nov. 11-13 — Contact: AICPA, New York, N.Y. (212) 575-6200.

**Cals Expa '91.** Phoenix, Nov. 11-14 — Contact: National Security Association, Washington, D.C. (202) 775-1440.

**Narth American Telecammunicatians Assaciation Unicam '91.** Washington, D.C., Nov. 11-14 — Contact: Allan M. Olbur, Comserv, Inc., Glenview, Ill. (708) 657-9000.

**Windaws.** Boston, Nov. 11-15 — Contact: The Wang Institute of Boston University, Tyngsboro, Mass. (508) 649-9731.

**Datapra Unix & Open Systems Canference.** Brussels, Nov. 12-13 — Contact: Rosemary White, Datapro/20, Berkshire, England (011-44) 628 773277.

**Autafact '91.** Chicago, Nov. 12-14 — Contact: The Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-0777.

**Nartheast Computer Shaw.** Boston, Nov. 13-15 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

**LAN/WAN Suppart Farum.** Washington, D.C., Nov. 13-15 — Contact: Help Desk Institute, Colorado Springs, Colo. (719) 531-5138.

**imoge Campression Canference.** San Jose, Calif., Nov. 14-15 — Contact: BIS Strategic Decisions, Woburn, Mass. (617) 893-9130.

**The X Windaw Systems Farum.** Boston, Nov. 14-15 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

### NOV. 17-23

**The New Taols Conference.** New York, Nov. 17-20 — Contact: The Center for Computer Graphics for Design, Briarcliff Manor, N.Y. (914) 741-2850.

**Multimedia Expo.** San Jose, Calif., Nov. 18-20 — Contact: American Expositions, Inc., New York, N.Y. (212) 226-4141.

**Sopphire '91.** New Orleans, Nov. 18-20 — Contact: Systems Applications and Products, Lester, Pa. (215) 521-4500.

**Wescan '91.** San Francisco. Nov. 19-21 — Contact: Electronic Conventions Management, Los Angeles, Calif. (213) 215-3976.

**The 2nd Usenix Moch Symposium.** Monterey, Calif., Nov. 20-22 — Contact: Usenix Conference Office, El Toro, Calif. (714) 588-8649.

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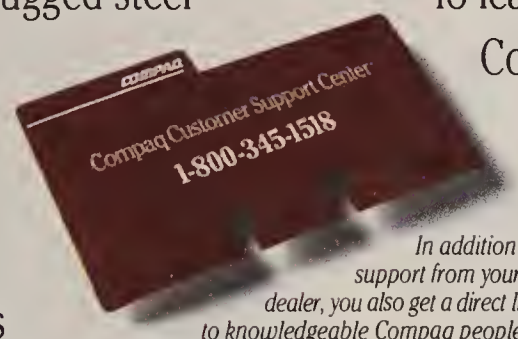


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# Heartland

FROM PAGE 71

different, Schemerhorn explains, so he had to bring in American systems and software. With Chrysler's advice, Diamond Star bought McCormack & Dodge (now Dun & Bradstreet Software) financial applications and two IBM 4381 low-end mainframes. Earlier this year, Diamond Star replaced the 4381s with a new IBM Enterprise System/9000 Model 260.

The ALC and the ES/9000 share data, and getting them to talk to each other was largely Marty Bell's job. Bell, branch manager of the applications group, spent several weeks in Japan working with Mitsubishi programmers to design interfaces between the two systems. "It's an unbelievable learning experience, culturally and businesswise," Bell says.

About 350 Diamond Star workers, including most of the entirely American IS staff, have been to Japan for between four and 37 weeks of training. Everyone says they are still learning. Schemerhorn carries homemade flash cards in his breast pocket to improve his Japanese in spare moments.

The company budgets in typically Japanese six-month cycles, instead of the yearly periods that most U.S. companies use. The half-yearly budgets give Diamond Star better control of its money and its abilities to forecast more accurately and to respond more adeptly to market changes, according to Schemerhorn.

But the system can make projects tricky to pitch.

"Six months is a pretty small window [in which] to set up a new technology and start seeing returns on it, so everything we do is well thought out," says Mike Wilkinson, branch manager of operations and technical support.

That motto has been entrenched at Diamond Star from the beginning, due largely to Mitsubishi's forethought, the IS staff says.

Ishida came over from Mitsubishi's headquarters in Japan to guide Schemerhorn and his newly hired IS staff through Diamond Star's whirlwind start-up period.

The company launched all 30 of its manufacturing and business departmental applications during its first 18 months in business, according to Schemerhorn.

Work like that also takes dedi-

## Nick of time

One project that is a true meld of Japanese and U.S. ideas is Diamond Star's new inventory control/just-in-time (JIT) delivery system. Here JIT means literally down-to-the-minute supply management.

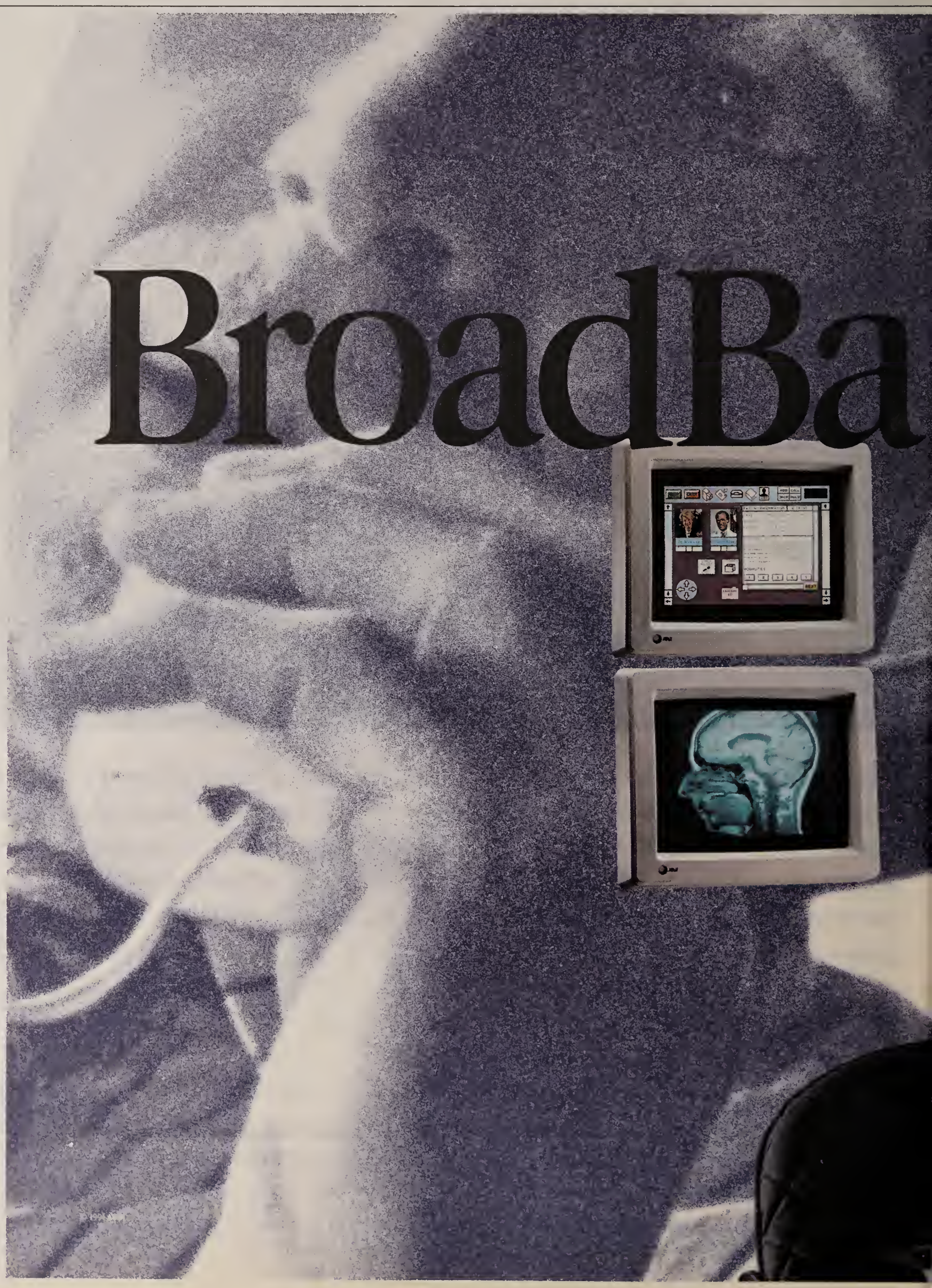
The company uses about 150 production parts suppliers for the five car models it makes. Forty percent of those suppliers are in Japan, and 60% are in or near Illinois.

The Assembly Line Controller (ALC) knows that 42 minutes after a car starts the final assembly process, it is ready to have seats installed.

ALC schedules delivery of the required seats from its supplier, Bloomington-Normal Seating Co., located half a mile away in Bloomington, Ill., to correspond with the different kinds of cars traveling through the assembly line. The seats arrive at the loading dock in that specific order and are carried by ALC-scheduled overhead transports from the dock to the line, just as the car reaches the seat installation station.

"Our version of JIT is a little more literal than the typical American version. It really is just like clockwork," says Rex Schemerhorn, manager of information systems.

KIM S. NASH



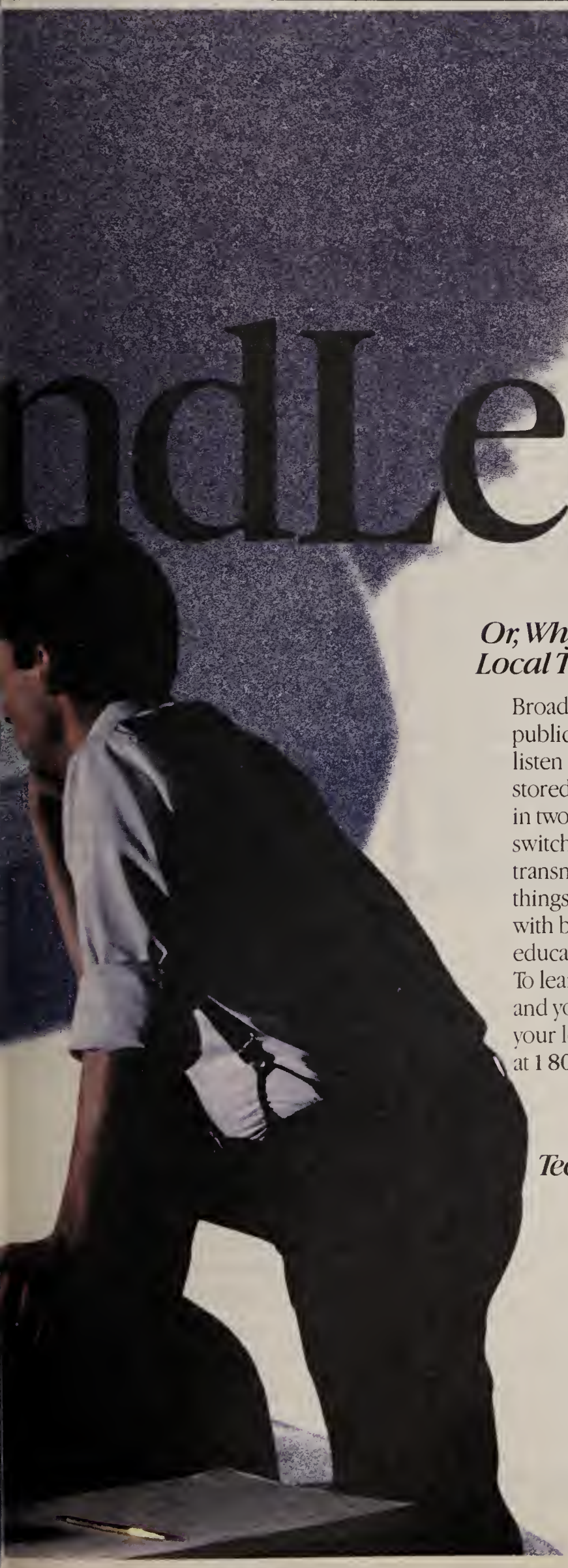
cation, which is a point of pride for Schemerhorn. He says the exciting, entrepreneurial nature of the company is only part of what inspires people to put in long hours to make Diamond Star successful. The other half is the Eastern influence. "The way we operate makes each person, at every level, feel responsible for the final product, so we make better decisions here."

# What's under the hood?

Diamond Star Motors Corp. boasts of being one of the most automated carmakers in the world. The following technology helps drive the firm:

- Two Mitsubishi Automotive Line Control computers, mainframe-class machines specially built for car manufacturing.
- Five hundred assembly-line robots, about twice the number in the average car plant.
- An on-line vehicle tracking system that scans a unique set of punches behind the radiator of each car.
- An on-line inventory control system launched last month to supplement just-in-time delivery.

KIM S. NASH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MANAGEMENT SHORTS

# EPRI wins SIM award

The **Electric Power Research Institute** (EPRI) in Palo Alto, Calif., was awarded first place in the **Society for Information Management**'s (SIM) 1991 International Paper Awards Competition. The award was presented at the SIM annual conference last week in Chicago.

EPRI was honored for a paper describing EPRInet, a system that re-engineered the way the institute distributes its research to its 700 member utilities. Through natural language front ends, electronic mail and other technologies, members can access EPRI research databases containing more than 8G bytes of information.

The paper's authors were Marina M. Mann, director of the Information Technology Division at EPRI; Richard L. Rudman, senior vice president of business operations at EPRI; Thomas A. Jenckes, technology transfer manager at EPRI member Pacific Gas & Electric Co.; and free-lance writer Barbara McNurlin.

The team donated its $500 first place prize to the mathematics department of Lewis & Clark College in Portland, Ore.

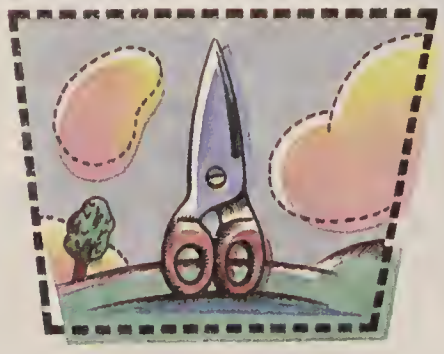
**Temple, Barker & Sloane, Inc.** and **Strategic Planning Associates** have announced a new consulting practice to help companies compete in the information economy of the next century. Entitled 2020 Realities, the practice will be directed by futurist Stanley Davis, author of *Future Perfect* and *2020 Vision,* as well as Temple, Barker Vice Presidents Christopher Meyer and David Power.

The practice was designed to help clients "informationalize" their products and services as the global economy continues to evolve into one in which information is the key competitive differentiator, the firm said. Temple, Barker is based in Lexington, Mass.

**Thomas H. Yacko** has been named to head **Ernst & Young**'s San Francisco-based information technology practice for Northern California and the Pacific Northwest. Before joining Ernst & Young in 1977, Yacko, 46, was manager of corporate data processing at Litton Binoetics, Inc.

Yacko most recently was a partner at Ernst & Young's utilities information systems consulting group, coordinating the firm's statewide IS consulting services in Florida and heading the Southeast region's utilities IS practice.

## CLIPS



Tim Lewis

*Summaries from leading scientific and management journals*

### "Achieving better systems development through usability testing"

*By Michael J. Prasse*

**Journal of Systems Management**
**September 1991**

■ Before any thought is given to alpha or beta testing of new hardware and software products, usability testing should be on the minds of the developers. This testing method simply involves looking at a product very early in the development cycle to see whether its expected users will find it easy to learn and use.

By the time most companies get around to beta testing, the product has been given an OK from the alpha testers. The problem is that often the alpha testers have a higher level of computer expertise than the intended users of the product. When the intended users become beta testers, the product is well along in the development stage. Extensive changes at this point can be costly.

One way to conduct usability testing is to employ operational prototypes of the product or even simple screen drawings. In software usability testing, for instance, the usability testers view prototype screens and then are asked to describe what they believe would happen if they conducted an action shown on the screen. By comparing the results the users expected to see with the screens planned by the developers, the system builders can create a product that is more intuitive for the users — and the process can take place before much time or money has been expended. — *Alan J. Ryan*

### "Enhancing your corporate image"

*By Hal Bredbenner*

**Inform**
**September 1991**

■ Image data has become an important resource for today's companies. Many firms are now building corporatewide imaging systems to maintain data, and companies must address many issues when planning for imaging.

Prior to implementation, for instance, management of the system should be studied. Security issues, scheduling and a backup plan must be addressed. Who will determine user passwords? What departments will have access to what information? When will the systems be available? Resolving these issues in the planning phase saves time and headaches later.

Each department will want its own applications since each will want to gain its own benefits from the system. Choosing the proper items on a system will be most important. Consider the following: choice of optical disc, retrieval and caching capabilities, magnetic storage and maintenance needs.

Intangible items such as teamwork and commitment must also be addressed. Without proper cooperation and communication between business units, any project can go astray. — *Steven J. Condon*

### "How effective is data resource management? Reassessing strategic objectives"

*By Varun Grover and James T. C. Teng*

**Journal of Information Systems Management**
**Summer 1991**

■ Database management systems, long hailed as a cure-all for data integration and redundancy woes, are not living up to their purported benefits.

In a study of 276 corporations, the authors examined the effectiveness of data resource management by comparing the most written-about benefits of DBMSs with actual benefits realized. Interestingly, the most direct benefits — including reduction of systems maintenance and applications development time and cost — ranked lowest on the list of actual benefits achieved through DBMSs.

Further, the study showed that the advantages of DBMSs most written about — reduced data redundancy, integration of applications and the ability to handle unanticipated information requests — were not the most frequently realized benefits. Instead, the top improvements were improved data integrity and provision of a more powerful file management method.

A lack of sophistication in data resource management can lead to the fact that the strategic benefits of DBMSs, such as reduced applications development time, are not always realized.

Companies that are not achieving their DBMS goals should implement a data administration concept. That involves a separation of database administration (with a more technical orientation) and data administration. — *Alan J. Ryan*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# LAN

**Leading vendors of Local Area Network (LAN) products have come together to provide an overview of the features, applications and benefits of LANs. For more information on how you can benefit from LANs call these leading vendors today.**

A LAN is a combination of hardware, software, and cables which connect or "network" two or more computers within a localized area. The LAN makes distributed processing possible. It allows users to communicate and share applications, data and peripherals.

## LAN BENEFITS

With a relatively low investment in LAN equipment, users can achieve the following benefits:

- **Distributed Processing**

  A LAN distributes processing power among the user's workstation and other network resources. This improves response time and productivity.

- **Lower Costs & Shared Resources**

  Costs are lowered as resources are better utilized through efficient sharing among many users.

- **Access to Shared Data**

  LANs provide users with access to shared data, improving work flow and productivity. LANs also preserve data integrity by managing access to data.

- **Better Use of Existing Resources**

  Through resource sharing , LANs help organizations get more mileage out of existing resources. The same resources can serve a greater number of users.

- **Display/Workstation Freedom of Choice**

  LANs are hardware independent. Users are free to choose workstations, X Terminals or PCs from a variety of vendors and have them work together on the LAN..

- **Centralized Back-Up**

  System and workstation back-ups are accomplished through the LAN and can be done automatically.

- **Interconnectivity**

  LANs can communicate with mainframes, minis and other local area networks. This allows a LAN user to communicate with other parts of their organization.

- **High Speed Communication**

  Most LANs operate at higher communication speeds than other networks and offer excellent response times. LANs also improve organizational communication through electronic mail and workgroup software.

## Hardware Components

### File Server:

A high-speed computer that functions as the central repository of data and/or application programs for the network. The file server:
- manages the network centrally
- processes communications
- controls user access
- shares printers

### Disk Subsystem:

Increases the file server's storage space. Provides performance and reliability that make remote resources appear local.

### Workstation:

A user's desktop computing system that can be used for running applications, crunching numbers, etc..

### Network Interface Card:

A network interface card is inserted into every workstation on the LAN and the file server. Its main task is to form data packets, transmit them onto the network and receive them from the network.

### Transmission Media:

Connect all LAN devices and carry all the data packets to and from the file server. Common media are coaxial cable, twisted-pair cable, fiber-optic and wireless.

## Software Components:

### Network Operating System (NOS):

Resides on the file server and controls virtually all the activity on the network. It manages connections and resources among LAN devices.

### Workstation Operating System:

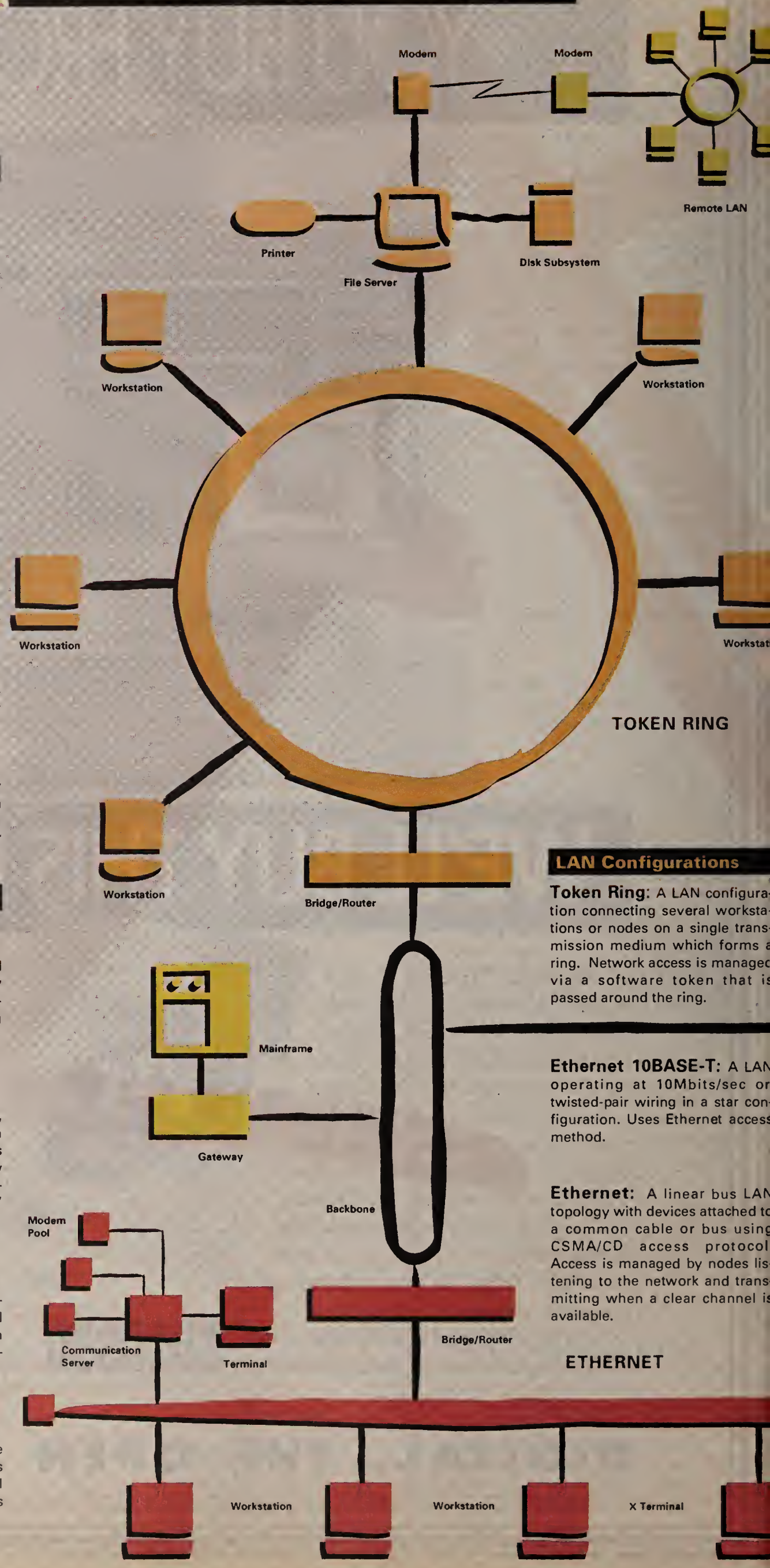
Software (e.g., DOS, UNIX, OS/2, MAC OS) that allows workstation to run applications. Open systems standards such as MIT's X Window protocol allow simultaneous access between different vendors' hardware and operating systems.

### Network Management Software:

Provides analysis of network performance, diagnosis of abnormal network operation, configuration information, inventory management and network security.

### Network Enhancement Software:

Allows resources attached to the file server or local workstations to be shared and accessed by all network users. Also enhances user-network interface.




## LAN Configurations

**Token Ring:** A LAN configuration connecting several workstations or nodes on a single transmission medium which forms a ring. Network access is managed via a software token that is passed around the ring.

**Ethernet 10BASE-T:** A LAN operating at 10Mbits/sec on twisted-pair wiring in a star configuration. Uses Ethernet access method.

**Ethernet:** A linear bus LAN topology with devices attached to a common cable or bus using CSMA/CD access protocol. Access is managed by nodes listening to the network and transmitting when a clear channel is available.

## Extending Your LAN

A LAN can communicate with other LANs and computing resources. Components that extend a LAN and create internetwork communication include:

**Backbone:** A common, high-speed medium (e.g., fiber optic) that links several LANs or computers.

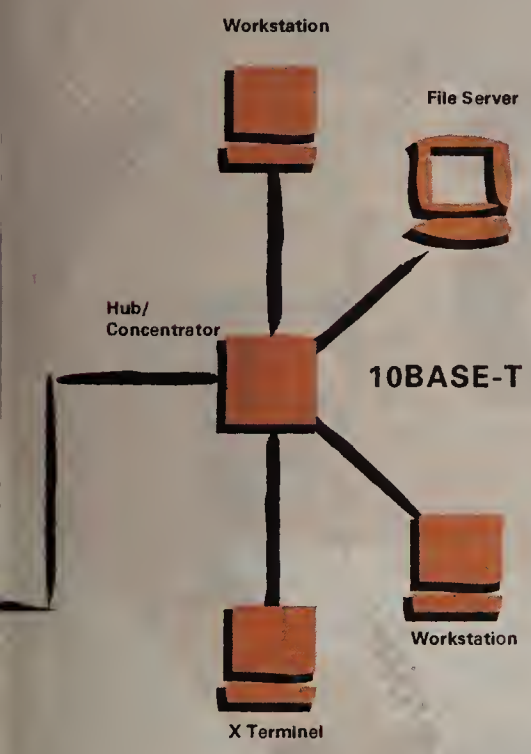
**Bridge:** A computer or other device which connects two or more LANs.

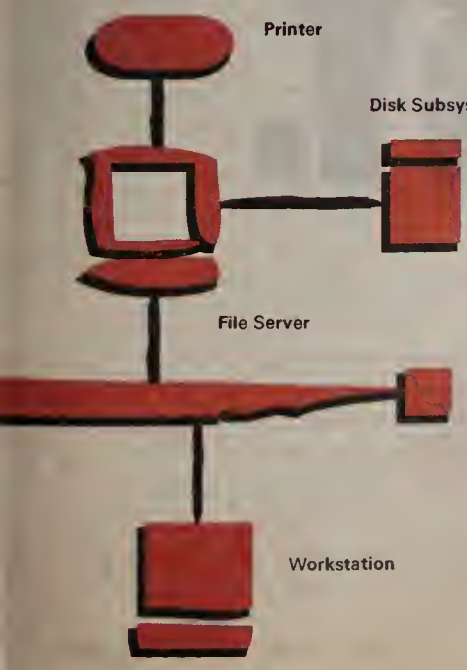
**Gateway:** Allows users on a LAN to communicate with other systems, such as a minicomputer or mainframe.

**Router:** Used to route messages through several connected LANs or on a Wide Area Network.

**Communication Server:** Connects multiple serial devices (modem pools, printers, PCs and terminals) to a network.

**Smart Hub:** A central wiring device that allows many networking devices to share a network interface connection. Intelligent concentrators provide additional network management and control capabilities.

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# The ethics gap

*Despite growing attention, many IS managers say, 'It's not my job'*

Alan Levenson

**Shoars** *is still kicking after getting the boot for questioning alleged E-mail monitoring at Epson America. 'You don't read other people's mail, just like you don't listen to their phone conversations'*

BY GLENN RIFKIN

For Alana Shoars, the ethics of electronic mail snooping are black and white. "You have to be able to look in the mirror," says Shoars, who was fired last year as E-mail administrator at Epson America, Inc. for questioning the company's alleged monitoring of employee messages. "Right is right, and wrong is wrong. There is no in-between."

In much of the computing and business world, however, opinions are quieter and much less definite — when there are any opinions at all.

Despite Shoars' much publicized dismissal and a related $75 million class-action suit against Epson now pending in a California court — as well as a similar lawsuit filed against Nissan Motor Co. — the topic of computing ethics remains largely the province of consultants and academicians and is largely ignored by information systems professionals.

Ironically, such indifference comes at a time when network monitoring technology and other computing tools raise a whole new series of complex ethical questions for IS, its organizations and the courts (see story page 89).

Much of what discussion there is focuses on E-mail monitoring, thanks to the medium's popularity, well-publicized lawsuits and high potential for snooping.

Rifkin is a free-lance writer and a former *Computerworld* features editor.

However, other important issues include personal, emotional and controversial questions about information access, monitoring and ownership, software copying and database privacy (see story page 84).

Despite the enormous personal, professional, corporate and legal importance of such questions, genuine debates and policies about ethics among computing professionals are still relatively rare, according to IS chiefs and academicians.

Michael Simmons, chief information officer at Bank of Boston Corp., says the subject of ethics doesn't often arise among IS professionals. If the topic was discussed, he says, "It would be a very short meeting."

> POLICIES AND debates about ethics among IS professionals are still relatively rare, despite their importance.

Observers say the main reasons for this disinterest appear to be the nature of IS people and their tasks, fear of losing one's job and a widespread belief that an ethics policy is best handled by general management.

Many technology executives deny assertions that IS has ignored the issue.

"I've not seen ethics as an issue," says John Coman, manager of networks and information services at Atlantic Richfield Co. in Los Angeles. "In 28 years in this business, I could count on one hand the number of times I or somebody else had to point out ethical issues in IS."

However, that widely held view is at odds with what researchers in the field say. They note that corporate codes seldom address computing issues specifically and assert that IS has a professional responsibility to take a more active role in defining

*Continued on page 84*

**IS Ethics**

**KEY POINTS**

▶Lack of interest in information systems ethics appears to stem from the nature of IS people and their tasks, fear of losing their jobs and a widespread belief that ethics policy is best handled by general management.

▶The growing availability of low-cost network monitoring software as well as personal computers is raising new ethics-related questions (see story page 89).

▶Most ethical concerns involve questions of privacy, integrity, influence and impact.

▶General corporate codes of ethics at many companies are seldom detailed enough to adequately cover information and technology systems (see story page 87).

▶A study of 300 college computer science and business majors suggests that tomorrow's leaders may have less moral conviction about computing ethics than today's executives do (see story page 90).

▶QUOTABLE:

*If the topic of ethics was discussed, "It would be a very short meeting."*

*Michael Simmons*
*Bank of Boston Corp.*

# Ethics gap

CONTINUED FROM PAGE 83

ethics for the information age.

"IS is falling short of meeting the [ethics] challenge," asserts Eugene Spafford, a computer science professor at Purdue University who teaches a graduate-level course in ethics for computer professionals.

"You teach somebody to drive a car, and there is a component on responsibility built in. But when it comes to computers, we don't do enough of that in universities or in corporate America," says Karen Forcht, associate professor of information and decision sciences at James Madison University in Virginia and author of a key study on student computing ethics (see story page 90). "Computer practitioners think they have their backsides covered, but they don't," she adds.

Tom Zimberoff

**Parker:** *IS should be held to higher standards*

One obstacle, according to F. Warren McFarlan, a professor at Harvard Business School, is that for people whose math, science and engineering backgrounds can make the world precise and quantifiable, the social ambiguities of ethics discussions may be of very little interest. "This is a group that has not traditionally thought of these issues," McFarlan says.

Such lack of familiarity has led technologists to approach information resources in a unique way, notes Detmar Straub, assistant professor of MIS at the University of Minnesota.

"They say, 'If the system can do it, let's do it,' rather than, 'Should the system do it?' " Straub says. "I've talked to systems managers who say they wouldn't hire a programmer who couldn't break into any system."

Some confusion also stems from emerging laws regarding electronic communications. The federal Electronic Communications Privacy Act of 1986 protects the privacy of electronic messages sent to public networks.

However, there are few guidelines for internal corporate E-mail networks. Worse, some 200 or so state statutes covering related issues further complicate matters.

Another factor is that IS departments have long been considered service organizations and have removed themselves from ethical debates by saying, "Don't shoot us, we're just the messengers," according to academicians.

### Is IS wimpy?

However, H. Jeffrey Smith, assistant professor at Georgetown University's school of business administration, says this stance is no longer acceptable.

"If we [IS professionals] are going to be leaders in bringing strategic advantage to a corporation, we have to be leaders in ethical issues as well," Smith says. "There is no evidence that the IS community is willing to stand up and do that."

While completing a doctoral thesis at Harvard Business School on IS concerns about information privacy, Smith says, he discovered that most computing professionals took a subservient role in dialogues about information use. "The attitude seemed to be: 'Providing the data is our job, but using the data is the responsibility of the users.' This is troubling coming from an IS person."

The attitude of one bank IS executive is typical: "Even though I have . . . concerns [about how information is used], it is not our role in the IS community to beat the businesspeople over the head about this. It is our role to take their requirements and to implement them, not to bring our personal views in."

DuWayne Peterson, retired CIO of Merrill Lynch & Co., also notes that there are practical limitations on how much of a role IS can play in protecting information. He recalls back-and-forth discussions at the New York brokerage in which IS maintained that information protection was each supervisor's responsibility. At the same time, though, supervisors saw it as an IS function. "But IS can't possibly be everywhere," Peterson says.

To be fair, IS professionals differ little from other workers, who will generally defer to an executive or corporate decision before putting their jobs on the line.

Though no one questions the basic honesty and integrity of most computer professionals, there is an unstated belief that when push comes to shove, fearless honesty won't put bread on the table.

### PCs create new issues

The spotlight has shifted to IS in recent years because of the proliferation of powerful personal computers and vast communications networks.

"In the past, you couldn't be a miscreant and get a job in data processing," Bank of Boston's Simmons says. Computer professionals "were weird guys with plastic pocket protectors, but they were straight arrows. But in 1981, when anyone could buy a computer and get on the network, that changed the world."

Suddenly, as keepers of the information resource, IS folks faced a laundry list of ethical dilemmas ranging from privacy, data integrity and hacking to personal use of technology by employees.

These developments begged the question: How much ethical responsibility does an IS professional have? A full decade after the PC revolution, opinions vary widely.

"IS people should be held to a higher level of ethics than the general population, just as doctors and lawyers are," asserts Donn B. Parker, a senior management consultant at SRI International in Menlo Park, Calif., who for 35 years has

## What are IS ethics, anyway?

The ethical concerns that now confront information systems professionals fall into several categories, according to consultants, academicians and IS managers:

- **Privacy:** How is personal information collected, used and protected?
- **Integrity:** Who is responsible for data integrity, and how much effort is made to ensure that integrity?
- **Influence:** Reduced judgment in decision-making. How much does IS add to the automating of processes and decision-making, and what are the results in relation to human safety and well-being?
- **Impact:** What are the consequences of IS applications on the work force through up- and down-skilling of jobs? Also, what are the consequences on the work force due to surveillance, monitoring and measuring through computers?

Ethicists suggest that such a list could go on forever, with combinations of issues that encompass specific situations and work environments.

Eugene Spafford, a computer science professor at Purdue University, says technology has developed so rapidly that "the target is not well defined."

## Guidelines for action

*Experts say certain guidelines can be helpful in solving ethical dilemmas. The first set of suggestions is from Donn B. Parker, a senior management consultant at SRI International:*

- **Informed consent.** When in doubt about performing any particular action, inform those whom your action will affect of your intentions, and obtain their consent when applicable.
- **The higher ethic.** Take the action that achieves the greater good.
- **Most restrictive action.** Take the action, or avoid the action, by assuming the most severe loss that could happen.
- **Kantian universality rule.** If an act or failure to act is not right for everyone to commit, then it is not right for anyone to commit.
- **Descartes' change rule.** A sufficient change in degree produces a change in kind. Whereas many small losses may be acceptable individually, taken as a whole, they may result in unacceptable losses.
- **Owners' conservative rule.** Assume that others will treat your assets as belonging in the public domain. Explicitly declare the products of your efforts and your property to be either private or public in reasonably visible ways.
- **The users' conservative rule.** Assume that any tangible or intangible item belongs to somebody else unless an explicit declaration or convention identifies it as being in the public domain or authorized for your use.

*The following guidelines are from Ouellette & Associates Consulting, Inc.:*

1) Specify the **facts** of the situation.
2) Define the moral **dilemma**.
3) Identify the **constituencies** and their interests.
4) Clarify and prioritize the **values** and **principles** at stake.
5) Formulate your **options**.
6) Identify the potential **consequences**.

## Shoars update

The two most closely watched cases involving a company's alleged surveillance of electronic mail are still pending in the California courts, where they may take years to resolve.

The first suit, filed last March by former E-mail administrator Alana Shoars, alleges wrongful termination, defamation and invasion of privacy by her former employer, Epson America, Inc. in Torrance, Calif. She is seeking $1 million in damages.

Last July, Shoars filed a class-action suit in Los Angeles Superior Court seeking $75 million for 700 Epson employees and approximately 1,800 outsiders whose E-mail may also have been monitored.

Shoars, 32, contends that she was fired because she questioned the company's practice of monitoring and printing employees' E-mail messages. She is presently employed as an E-mail administrator at Warner Brothers, Inc.

Epson's lawyer, Michael Lindsay at Graham & James in Los Angeles, says Shoars opened an MCI:Mail account for her own personal use, which led to her firing. A California administrative law judge dismissed this argument, ruling that Shoars could collect unemployment.

Scott Edwards, a spokesman for Epson America, says the company has no policy to read E-mail.

"Epson could have settled this in two seconds, said 'Oops' and put her back to work," says Noel Shipman, Shoars' Los Angeles attorney. "Instead, they said, 'This is our computer — we'll monitor if we want to.' They got caught with their pants down and refused to pull them up."

It is likely to take years for Shoars' suits to be decided.

done extensive research and writing about ethics and information systems.

Unfortunately, even the noblest statements of values can run smack into the harsher realities of business. Few IS executives, for example, would have much sympathy for Shoars.

If anything, the monitoring of E-mail is growing, and many CIOs agree that E-mail is part of the business property and, therefore, employers have a legal right to see what it is being used for.

Simmons, for example, points to a previous job in which he discovered an employee using his computer to handicap horse races. Another worker ran his Amway business on his terminal at work, according to Simmons.

Both employees were fired on the spot, Simmons says. "The guy handicapping horses was using 600M bytes of memory," he adds.

### Company assets

For Simmons and many others, the answer is clear: "If the corporation owns the equipment and pays for the network, that asset belongs to the company, and they have a right to look and see if people are using it for purposes other than running the business."

This view is shared by many firms, including Federal Express Corp., American Airlines, Pacific Bell and United Parcel Service, Inc., whose E-mail system automatically informs employees that the company reserves the right to monitor E-mail messages.

Simmons does concede that employees must be informed from the day they start working what the rules are about E-mail and other computing resources. "If they are not told they are being monitored, that's not fair," Simmons says.

Others, such as Mike Godwin, general counsel for the Electronic Frontier Foundation, a nonprofit group, insist that monitoring E-mail or searching through electronic files is flat-out wrong. "It's inconceivable to think of a circumstance where you should look at anybody else's electronic mail," Godwin says.

"Even if a company does post notice, is that something they should do?" Purdue's Spafford asks. "The legal question is fine, but is it ethical? The company may say it is, but the employees say it isn't, and there's a conflict."

Shoars, now an E-mail administrator at Warner Brothers, Inc. in Burbank, Calif., also sees the case as clear-cut. "You don't read other people's mail, just like you don't listen to their phone conversations."

"Asking who owns the E-mail or the phone call is asking the wrong question," Godwin adds. "A better question is, 'What kind of environment do people work most happily and efficiently in?' If I worked in a place where they reserved the right to look at my E-mail, I'd be less happy." Others, including labor unions, have pointed out that employee monitoring can be demoralizing and counterproductive.

### Issue heating up

Despite such controversies, it seems unlikely that most IS organizations will be taking the lead by articulating their own policies on ethics any time soon.

According to Simmons, such policies must be a compendium of "what others believe we are doing and should be doing." He suggests that IS leaders meet with corporate executive committees to form codes of ethics rather than attempting to dictate policy themselves.

Even so, there are recent indications that the issue is far from dead and will probably heat up in coming months. In August, The First National Conference on Computing and Values, held at Southern Connecticut State University, drew luminaries from IS, computer security, privacy law, academia and philosophy. Organizers called the conference a success and said they were planning another.

The Privacy for Consumers and Workers Act, which calls for the regulation of electronic monitoring, is working its way through the U.S. Senate and House of Representatives. Verdicts in the suits against Epson and Nissan will undoubtedly send lawyers and corporations scrambling.

Besides the Electronic Frontier Foundation, groups such as the Electronic Mail Association, Computer Professionals for Social Responsibility, the American Civil Liberties Union and others continue to lobby to raise public awareness.

An increasing number of colleges and universities have begun teaching computing ethics (see story page 90), and more articles and seminars on the topic are being published in trade and academic journals. Parker and two associates from SRI, Susan Swope and Bruce Baker, recently published a book on the subject.

In early October, the Electronic Mail Association released a detailed "tool kit" for companies interested in creating corporate privacy policies about E-mail.

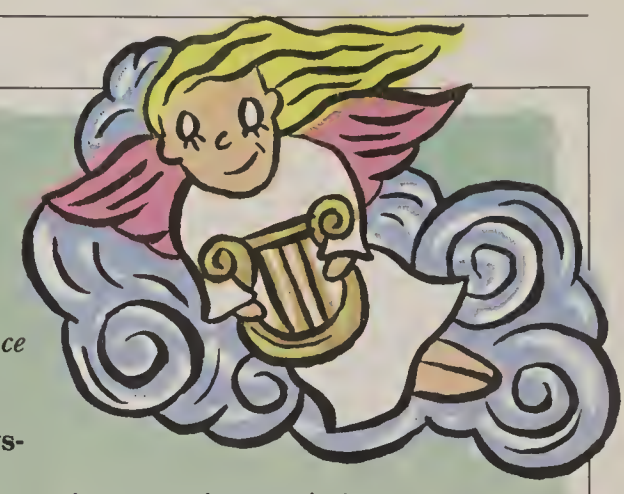
Despite such activity, many say that major changes are unlikely to occur unless backed by corporate heads. "The only way to get people to stand and defend ethical positions is if they believe that people at the top are ethical," Peterson says. "IS is part of the culture."

Parker points out that unlike medicine or law, which have had centuries to evolve ethics, IS has been around for fewer than 40 years. Despite the field's relative youth, Parker says, a whole new set of ethics for computing is unnecessary. "We have all the ethics we need, and we know what they are," he says. "The Golden Rule still applies."

The big challenge, Parker says, is applying those values in a new environment, so that "when a person logs on to a computer or network, they don't automatically turn off their ethical values."

Arco's Coman says he agrees: "When it comes down to it, ethics are what your mom and dad taught you when you were a little boy or girl, and those things are still valid." •

# Right or wrong?



What is ethical? Unethical? These were the questions behind a landmark study of computing ethics by SRI International in Menlo Park, Calif.

Some 27 business and information systems professionals, ethical philosophers and lawyers were asked to respond to two dozen scenarios and decide if they were ethical.

Their responses later formed the basis of a book titled, *Ethical Conflicts: In Information and Computer Science, Technology and Business,"* (published by QUED Information Sciences, Inc., 1990).

Read the following scenes and decide if they are ethical or not. Responses from the SRI panel are listed below.

**Situation 1: The silent manager.**
A programming department manager discovers that one of his programmers and another from the inventory control department are involved in a corporate plan to defraud company stockholders by inflating company assets.

The programs in question passed his quality assurance testing because they were identified as simulation and test files. Eventually, the fraud was discovered and the perpetrators were prosecuted. The programming manager — who is responsible for all applications programming throughout the company but who had no knowledge of the scheme — was identified as an unindicted conspirator.

*Question: Was the manager unethical in not responding to evidence of wrongdoing?*

**Situation 2: The bare-bones system.**
A programming analyst at a large retailer is charged with project responsibility for building a customer billing and credit system. During the project, money runs out.

The programming analyst had continually warned management about impending problems but was told to keep going and finish the development of a bare-bones system as quickly and cheaply as possible.

To meet this directive, several key features — including safeguards, error detection and correction — had to be left out until later versions.

After a difficult and costly conversion to the new system, a great many unfixable problems arose, including wrong and unreadable billings and credit statements. Customers were outraged, fraud increased, company profits fell, and the project leader was blamed for it all.

*Question: Was it unethical for the project leader to order the system into production prematurely?*

**Situation 3: The nosy security manager.**
The information security manager at a large company also acted as administrator of a huge electronic mail network. During his regular monitoring of mail, the manager discovered personal messages about football bets, sexual encounters and other nonbusiness matters.

Printed listings of the messages were regularly given to the company's human resources director and corporate security director. In some cases, managers punished employees, using the messages as evidence.

Employees became angry, charging their privacy rights on E-mail were the same as the company's telephone or interoffice mail system.

*Question: Was it ethical for the information security manager to monitor E-mail and inform management of personal use?*

**Situation 4: All work, no play.**
The manager of research at a computer company explicitly told workers that anyone found playing games on company computers would be subject to dismissal.

On a random inspection, a computer game was discovered in the files of a programmer, who was then punished.

*Question: Was it ethical for the manager to prohibit the use of computer games in employee files?*

**Situation 5: It's not our job.**
A software professional was charged with developing control software for part of a large system. The job looked straightforward and trouble-free. To work, the software required input from other units in the system.

The developer then read an article by a noted software specialist and was convinced that input from the other units could not be trusted. So he decided that neither the software he was designing nor the unit his company was providing would do the job they were supposed to.

He showed his supervisor the article and explained his concerns, but was told only to worry about his group's part of the project.

*Question: Was it ethical for the developer to continue working on the project?*

***RESPONSES***

**Situation 1:** *unethical: 23; not unethical: 1; no ethics issue: 0.* **Situation 2:** *unethical: 24; not unethical: 0; no ethics issue: 0.* **Situation 3:** *ethical: 22; not unethical: 2; no ethics issue: 0.* **Situation 4:** *Unethical: 7; not unethical: 5; no ethics issue: 13.* **Situation 5:** *unethical: 12; not unethical: 7; no ethics issue: 1.*

Art by Lindsey Loch

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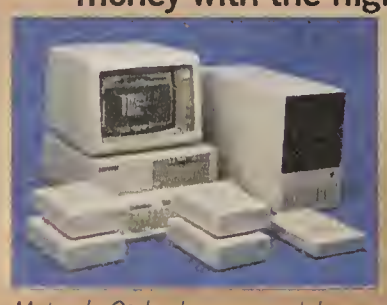

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# Are corporate codes enough? Maybe not

BY GLENN RIFKIN

Many information systems executives maintain that company codes of ethics are sufficient and that separate guidelines for IS are not necessary.

However, a close examination of such codes raises questions about how well equipped general guidelines are to deal with specific applications of information and technology.

United Technologies Corp. in Hartford, Conn., for example, adopted a 21-page formal code of ethics in January 1989. While the corporate code is quite specific about issues such as drug and alcohol abuse and equal employment, it says nothing about computer technology.

A section on employee privacy states, "United Technologies operates on the firm belief of respect for employee privacy and dignity." But the rest of the section speaks only of personal information about employees; no mention is made of electronic mail or data networks. A section on proprietary information addresses trade secrets of United Technologies' customers and suppliers but doesn't mention employees.

The code does address the issue of intellectual property, and it calls on every employee to be responsible for the proper use of corporate assets, including its property, plants and equipment.

One problem with relying on corporate codes to cover IS is that not every company has them. A recent survey by Robert Half International, Inc., the worldwide personnel service, found that only about 44% of the largest companies in the U.S. were seen to have a commitment to a written code of ethics.

Even at such companies, critics say, codes are often only glanced at before being shoved into a desk drawer or discarded.

### Filling a gap

The need for an IS code of ethics is by no means unanimous. John Owens, vice president of IS at Carrier Corp. in Farmington, Conn., is among those who contend that questions about technology can be addressed under the company's code of ethics.

"IS wouldn't write its own code," says Owens, who is also president of the Society for Information Management (SIM).

Many computing societies — including the Data Processing Managers Association (DPMA), the Association for Computing Machinery, the Institute of Electrical and Electronics Engineers, Inc. and the Information Systems Security Association — have formal codes of ethics for their members.

The DPMA code was established when the association was formed 40 years ago, according to Ralph Jones, executive vice president. The code is lengthy and detailed and includes such standards as, "I shall protect the privacy and confidentiality of all information entrusted to me."

Owens says SIM does not have a code, and there are no plans to establish one. "Our focus is on featuring success in the use of information systems to meet business objectives," he says. "There is not a perceived need for a code of ethics at this level."

Nonetheless, a growing number of companies are crafting specific codes to govern technology use. At AMP, Inc. in Harrisburg, Pa., for example, a 5-year-old policy governs E-mail use, says John Kegal, vice president of systems services.

The policy treats information as private information owned by the user. The IS department works with the user to determine who should have access.

"I won't tell you we were very clairvoyant on the front end," Kegal says. "But it's like moving into a new house. A year after you move in, you look around and see things you didn't see when you first moved in." •

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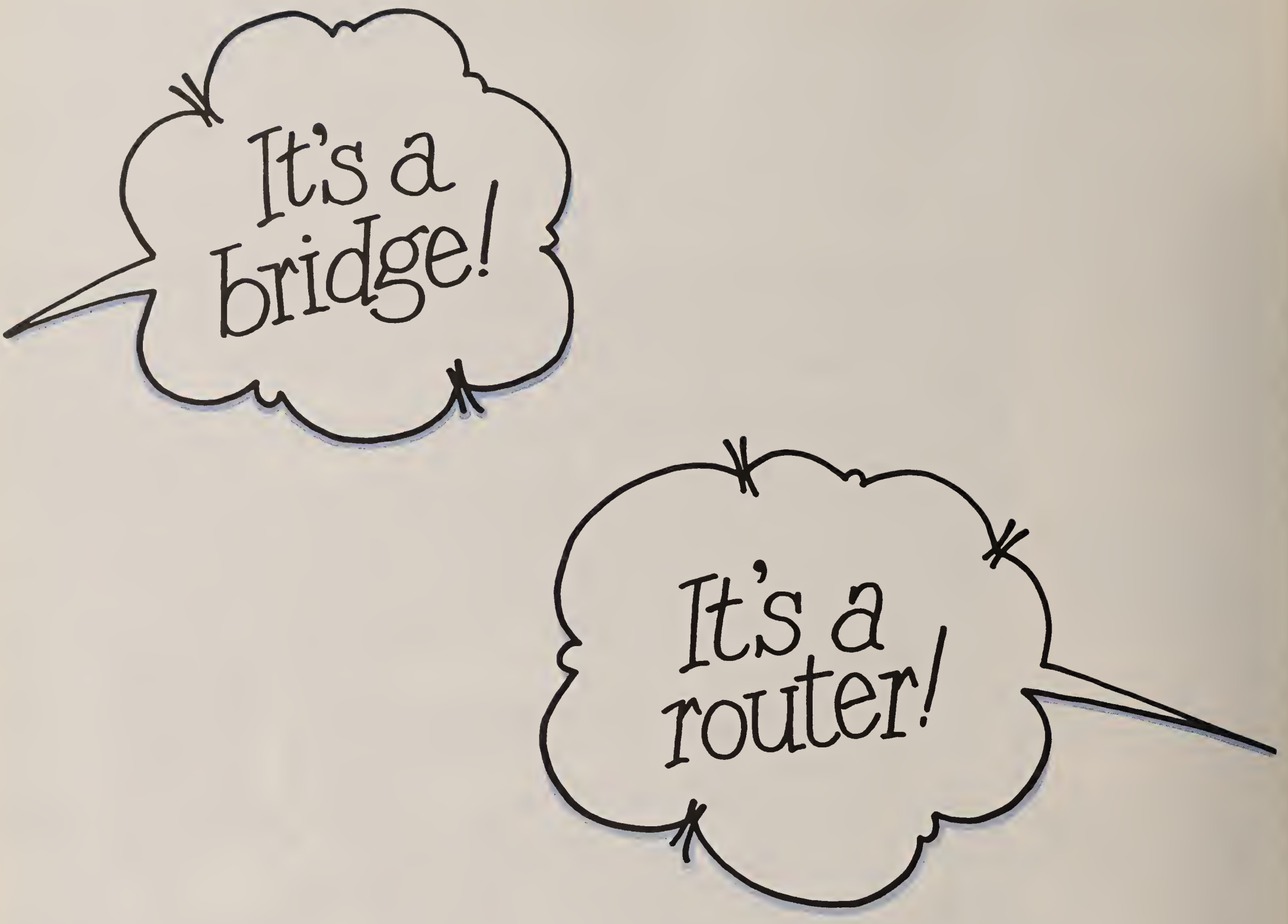


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# Technology raises many new ethics questions

BY JIM NASH

The growing availability of sophisticated, low-cost network software is increasing the number of computer users being electronically monitored and raising new ethics questions for information systems professionals, according to industry participants and observers.

However, makers of monitoring products say the responsibility for proper use lies with the buyer.

Technological advances mean that more computer users in the U.S. are being monitored than ever before, according to Lou Maltby, director of civil liberties in the work place for the American Civil Liberties Union in New York.

He cites figures from the U.S. Office of Technology Assessment: In 1987 — the year for which the most recent data is available — between 4 million and 6 million computer users were being monitored.

More than a dozen companies offer personal computer local-area network remote-control products. According to ethicists, the growing availability of such tools

**MORE COMPUTER USERS in the U.S. are being monitored than ever before, according to the ACLU.**

has raised a host of new questions about appropriate professional conduct for IS managers and workers (see story page 83).

Some products, which are made mostly by small companies such as Farallon Computing, Inc. and Avalan Technology, Inc., let LAN managers remotely connect to other networked PCs.

Some packages let managers "jump" from system to system and permit screen and even keyboard sharing. Many offer a "no-notify" option that can be used to hide the process from users.

In the past few months, numerous products that could be used for monitoring computer users have been introduced.

Network General Corp. in Menlo Park, Calif., for example, last month announced Expert Sniffer, an artificial intelligence-based network monitor priced between $12,500 and $16,750.

Harry Saal, the company's president and chief executive officer, says devices like his company's PC network analyzer can easily capture and display communications, including electronic mail, coursing through networks.

### Trust is key

While conceding that such devices could easily be used to monitor employee communications, Saal says, "It falls to the IS departments" to ensure that devices are not used maliciously. "You have to be able to trust IS," he says.

Other products are specifically designed to watch computerized workers. Secure Data, Inc. in Vernon, Conn., and The Parsec Group in Westminster, Colo., for example, market devices that give supervisors far-reaching surveillance capabilities.

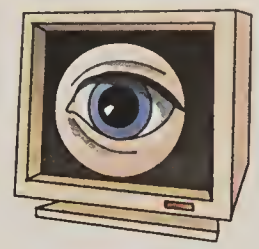
Secure Data's Lanstore, which records user keystrokes, is sold as an aid to re-create commands that cause a system crash rather than as a "Big Brother" aid, says Jack Davis, president of Secure Data. But the $495 product can also be used to graph worker activity with minute-by-minute accuracy, he says.

One Lanstore user, Glenn Fund, principal research specialist at Lockheed Sanders, Inc. in Nashua, N.H., says the product is used selectively and only for highly classified, defense-related files.

"We would never use it for anything other than special reporting and auditing requirements," Fund says.

However, he too concedes that such a device could be used to measure employee productivity.

Parsec's Security+ lets VAX/VMS systems managers identify potentially dangerous users and monitor their commands and terminal sessions, says Ed Roberto, Parsec's president.



The software, which sells for as little as $2,000, listens for red flags, such as words, logical names and whole or partial commands.

When they are detected, Security+ begins recording all transactions connected with the sequence that triggered the alert, Roberto explains.

By and large, Maltby says, employers can and do find legitimate reasons, including training, for using these types of devices. Fund notes that covert monitoring is an accepted part of many jobs classified by the company or the government.

But in all cases, Maltby adds, IS departments have a clear responsibility to inform users that they will be monitored, either continually or randomly.

Where possible, he says, devices should offer a real-time alert for employees — a light on a phone, for instance, or a visible notice on a computer screen that shows monitoring is taking place. •

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# New crop of IS pros on shaky ground

*The very spring and root of honesty and virtue lie in good education. — Plutarch*

BY DEREK SLATER

Scanning the new crop of computing professionals is likely to uncover more than a few bad seeds. It's hard to believe, but information systems and business students appear to worry less about computing ethics than do today's executives.

That is the conclusion of a landmark ethics study conducted at James Madison University (JMU) in Harrisonburg, Va. The results of the study echo a widespread belief held by the academic and business communities.

In 1989, questionnaires were sent to 300 JMU students between the ages of 19 and 45. Most were IS, business, accounting and finance majors and had computer-related work experience.

The startling result was that more than half of those polled admitted to using computers for "unethical means," including software piracy and hacking into off-limits systems.

Students at other campuses confirmed that such activity is rampant, especially among IS and MBA students.

### 'Ethical standards are lacking'

"This finding should cause great concern," wrote Karen Forcht and Anne Myong, who headed the JMU study. "Future consultants, bankers and government officials will be working with extremely sensitive information, and yet their ethical standards are lacking at this very early stage of their careers."

Students and researchers offer several reasons for the poor ethics among students. One common excuse attributes illegal software copying to the high price of commercial software packages.

"If it's something I use a lot, I tend to go out and buy it anyway," says James Crossman, a computer science undergraduate at Arizona State University in Tempe. Crossman explains that he owns extra copies of university-owned software for the convenience of working at home. "If I become proficient with a package now, I'm more likely to promote its use and purchase it later at a company."

Moreover, notes Deborah Johnson, a professor at Rensselaer Polytechnic Institute in Troy, N.Y., "There is this old academic value that information should be shared, that it should be a lot more open." Plus, many students see computer offenses as faceless and safe.

"Most students think it's OK because they're not the ones at risk," says Eduardo Castanon, a graduate student in human relations management at the University of Phoenix.

**NYU's Stohr:** *Teaching ethics to college students is 'a definite emphasis'*

An even bigger problem, students and researchers suggest, might be the mixed signals about computing ethics that students get from academic and business role models.

"We've gotten faculty coming in from other schools who have 20 unlicensed programs on their hard disk," says David Chappell, MIS computing manager at the Eller Graduate School of Management, University of Arizona at Tucson. "We won't support it, and they get upset."

"Business is amoral," declares Robert Kaufman, a 32-year-old graduate student in applied mathematics at Wright State University in Dayton, Ohio. He spent 10 years working in architectural engineering. "What managers say [about computer ethics] and what they do are two entirely different things," Kaufman says.

Edward Stohr, chairman of the IS department at New York University's Stern School, says ethics classes are mandatory for all MBA candidates. "It's a definite emphasis for us. We examine concepts of responsibility and liability, copyrights, etc.," he says.

But is it possible to teach ethics? To some degree, yes, academicians and students agree. "If they discuss it now," Stohr reasons, "they'll make decisions about ethics, and later they'll relate similar situations back to what their peers said." Others say college is too late. "Part of the problem is that we're getting people who've been using the computer since kindergarten and have gotten into some bad habits," Chappell says.

To instill good ethics early, a few progressive school systems have begun to discuss computing ethics as early as grade school.

That's not a moment too soon, according to Midi Cox, a computer training volunteer at Torrey Pines Elementary School in La Jolla, Calif. "The first thing some of the sixth graders said about using an E-mail program was, 'Oh, good, we're going to use this account to break into the Arpanet,' " Cox recalls. "They thought it was just a big joke."

Forcht agrees: "Ideally, ethics awareness would be introduced the day the computer is."

Eli Cohen, a professor at Eastern New Mexico University in Portales, N.M., has developed a curriculum for addressing ethical issues in the classroom. Cohen's method emphasizes student discussion on difficult hypothetical scenarios. Values are presented primarily by introducing the opinions of IS professionals into the discussion.

To some IS executives, the importance of lending this kind of voice is clear. "We're going to inherit these students in a few years," says Robert Tucker, general manager at Key Services Corp. in Albany, N.Y. "We have a professional responsibility."

Indeed, most agree that IS/student partnerships are crucial if computing ethics are to be anything more than just another required course.

Ultimately, according to researchers, the next generation won't take computing ethics seriously unless they believe there will be a reward for doing the right thing.

"Even though students . . . seem to follow very high standards of ethics and morals and obey laws," the JMU study concludes, "many feel that too often, compromise is evident and necessary in the work place in order to stay competitive." •

### Students flunk ethics

*More than half of the 300 students surveyed at James Madison University have used computers "for unethical means"*

- **Accounting and computer science majors are most aware of ethics issues ...**

  **Yet students in computer science are more likely than students in other majors to hack .**

- **Senior-level students rate their own morals as "very high" ...**

  **Yet senior-level students are more likely than younger scholars to use computers unethically.**

Source: Karen Forcht, Ph.D., James Madison University

## Ethics helpers

- The Electronic Mail Association in Arlington, Va., has a new 36-page corporate E-mail privacy policy tool kit ($45). For information, call (703) 875-8620.
- Proceedings of the National Conference on Computing and Values, Aug. 12-16, 1991, Southern Connecticut State University, New Haven, Conn. For proceedings, call (203) 397-4423.
- "Computer Ethics: Cautionary Tales and Ethical Dilemmas in Computing," Tom Forrester/Perry Morrison, MIT Press, 1990.
- "Computers Under Attack," P. J. Denning, Editor, ACM Press, 1990.
- "Computer Ethics," D. Johnson, Prentice-Hall, 1985.
- "Why be honest if honesty doesn't pay?" Amar Bhide and Howard Stevenson, *Harvard Business Review*, September/October 1990.
- "Ethics and Information Technology," from "SIM International Network" newsletter, September/October 1990.
- "The Information Game: Ethical Issues in a Microchip World," Geoffrey Brown, Humanities Press International, 1990.
- "Suit seeks to define user rights," Michael Alexander, *Computerworld*, May 6, 1991.

# Meet an IS ethics crusader and his long and lonely cause

It isn't easy being a crusader in computer ethics. Just ask Donn B. Parker.

Parker, a senior management consultant at SRI International in Menlo Park, Calif., has spent 35 years trying to drum up interest in the ethical behavior of computer professionals (see photo page 84).

An international authority, he has written books and articles on ethics, computer crime and privacy and has conducted landmark surveys in the field.

Parker, 62, says the whole process has been like pulling teeth. "You can't get funding, especially in a bad economy. You have to do this on the fly and squeeze it in when you can." Plus, he says, good volunteers are hard to find.

How does he keep going? "I spend a lot of time searching for grant money."

Parker has received funds from the U.S. National Science Foundation, the U.S. Department of Justice, the U.S. Department of Defense and others to research computer ethics.

His most recent survey resulted in a book titled "Ethical Conflicts" (QED Information Sciences, Inc., 1990). He has also written five other books on computer crime and integrity.

A mathematician by training, Parker developed an interest in computer security that later broadened to include the ethical and human side of computing.

"Ethics requires intelligence. You've got to be smart, especially in the area of human relations, and that's difficult for IS people to do. They are more skilled at interacting with the computer than with people."

Parker says that computers have greatly aided in the safety of data, but sophisticated criminal behavior and unethical use of technology poses a serious threat for which controls are still sorely lacking.

### Focus on hacking

Parker rails against the upswing in computer hacking.

"We have let juveniles with immature thoughts become too important," Parker states angrily. "We have to stop doing that and apply logical adult reason and tell these kids to get off the phone."

Because of his visibility, Parker often gets calls from information systems professionals seeking advice.

He also created International Information Integrity Institute at SRI, which provides ongoing services to 60 of the world's largest companies.

GLENN RIFKIN

# Another pat on the back for HP 3000 buyers.

In Computerworld's Buyers' Scorecard, the clear winner is Hewlett-Packard. According to the survey: "The (HP 3000) system captured the highest rating in 13 of 15 categories..."[1]

It went on to say: "While HP garnered its highest ratings in the categories of availability, future growth and compatibility, users also gave it very high marks in programming capability and interfacing with other vendors' systems . . . The system also topped the category of availability of third-party applications."

There's more. A study by the Sierra Group demonstrates that the HP 3000 has the lowest Cost of Ownership among the leading minicomputer companies.[2]

And in the latest Datapro User Survey, the HP 3000 achieved the best overall record among industry leaders for customer support satisfaction. For the eighth straight year.

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HEWLETT PACKARD

[1]Computerworld, 9/24/90. [2]The Sierra Group, 1990.
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*September 11, 1991*

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# Strength in numbers

*Networking several smaller AS/400s offers a cost-effective way to get the power of a big machine at a cheaper price*

BY FREDERICK P. CLARK

Ever notice the product packages labeled "large economy size" in the grocery store? These products are typically less expensive on a per-pound or per-item basis than those in the smaller packages. Less packaging and lower manufacturing costs translate into a lower price.

This "grocery store" thinking has typified corporate computer purchasing. When filling their computer data centers with hardware and software, companies have traditionally thought that the "large economy size" — one large, centralized computer — provides cheaper computer services than a number of smaller machines. Vendor pricing usually proved them right.

Times have changed, however. No longer is it true that a single, monolithic computer is always the cost-effective way to go. Today, with the existence of the IBM Application System/400, you can use the flexible and cheaper method of networking several smaller machines to handle your needs.

## Same power

Such machines can be configured (see page 96) for large applications processing so that their throughput equals that of a larger unit — minicomputer or mainframe — but their combined cost is often less.

That's the rallying cry behind distributed computing.

For example, two AS/400 Model D35s can be obtained for nearly 6% less than one Model D50 ($1,286,422 vs. $1,368,122, respectively, for comparable hardware and software); yet the two Model D35s have more combined performance throughput.

Application software could cost as much as 40% less when split onto two D35s instead of putting all the software onto the one larger model. Annual software maintenance fees could be reduced by 40% as well.

But the advantages of this distributed approach don't stop at lower costs for comparable performance.

In such a network of multiple machines, each machine is dedicated to the most appropriate processing while the network provides the machine-to-machine connectivity for a "source" system (the system that wants access to a remote file) to access the "target" machine (which has the file).

Data resides at the most appropriate location but appears to be local when accessed. This ensures the data integrity of a single place of storage.

Linda Bleck

Using remote telecommunications connections and/or Token Ring and the appropriate cabling provides the choice of aggregating the machines in one data center or locating them in various parts of a building (or campus) as departmental processors.

This setup maintains the connectivity needed for data access and administration.

Multiple machines can improve computer performance analysis and management, offering application users enhanced service. One of the common difficulties in centralized single-machine installations is managing end-user and application competition for computer resources.

Having separate machines, each providing service largely along business functional lines, prevents peak demand by one functional area (general ledger close, for example) from impacting the needs of ongoing operations (such as order processing and manufacturing).

Furthermore, multiple machines can also simplify computer capacity planning. Because processing is segregated by machine, IS staffers can monitor and manage use and growth patterns more easily — and allocate costs better.

With such a setup, for example, a company needing to upgrade its direct-access storage devices in response to increased use by the personnel and benefits system could limit its overhead expenses to the machine installed solely for that growing application.

## Paradigm shift

The capabilities of the AS/400 have changed the paradigm of how to configure large application processing installations.

The network becomes an integral part of the configuration, and the cost savings associated with multiple machines make it a compelling approach to consider.

One international consumer products company, for example, has been able to design an entirely new network and applications portfolio around multiple AS/400s, replacing the mainframe services provided by a sister company in the U.S. and by a service bureau in England. Savings are expected to be $3 million per year.

More importantly, the AS/400 architecture and its distributed capabilities have allowed the company to establish centers of expertise, from both a business function standpoint and an applications development standpoint, with processing power and the

*Continued on page 94*

Clark is a manager at International Systems Services Corp., a management consulting firm in Stamford, Conn.

**• A basis for distributed processing**

**• Cost, performance and feature breakdown**

**• How to configure your multiple AS/400s**

*Continued from page 93*

applications located near those centers yet accessible from anywhere in their network. This architecture allows global management of data and applications as well as centralization or decentralization, as business conditions warrant.

Does it mean this is the only way you should configure your installation? Not necessarily, but it certainly is one possible way to configure it — and a way that can save you money.

## Vaxcluster deja vu

The approach of combining several smaller machines for price/performance advantage over larger units is not specific to the AS/400, which builds on features that were originally part of IBM's System/36 line. Digital Equipment Corp. takes the same tack with its Vaxcluster.

There is a key difference between the two approaches, however. The AS/400 provides direct-access storage device sharing between machines at the file level, whereas Vaxcluster sharing is at the hardware unit level. Thus, on the AS/400, you are shielded from having to know what disk unit the data resides on. You need only reference a file; the network node's operating system manages where the data is physically located.

Let's get down to specific facts and figures. For starters, examine the price (IBM list — your price may differ) and performance of an AS/400 Model D80 vs. that of a Model D60 plus a Model D70 (see chart above right). Systems software costs include those for OS/400, Cobol/400, RPG/400, Application Program Driver, Performance Tools, Application Development Tools, Language Dictionaries, Query, SQL/400, Officevision/400 and PC/Support.

The first thing you will notice is that there is almost no difference in the total cost of the two setups. The single D80's costs are approximately $3 million, while the dual configuration rings in at $17,000 less. The combined RAMP-C performance of the two machines is almost the same as the larger machine. Thus, you can get two machines for the price of one.

### Don't settle for high cost

However, the cost of the two-machine configuration can be lowered. If you had the two machines at the same installation, you could cut back on duplicate systems software. It is probably not necessary to have RPG/400, Cobol/400, Application Development Tools and Officevision on both machines. RPG, Cobol and the Application Development Tools could reside on one machine for both programmers and analysts. Access to Officevision from the non-Officevision machine is provided by the AS/400's pass-through capability.

Eliminating all that software from the Model D60 would save you more than $50,000.

One disadvantage of the dual-machine installation is its higher monthly maintenance costs. The D60/D70 combination comes to about $379 per month more than a single D80. However, the present value of these added payments (discounted at 1% per month over five years) is less than $20,000 — not significant in the face of other savings available.

You can get some system software savings in this multimachine installation if you use IBM's Distributed Software Licensing Option (DSLO) for software on multiple machines. For the reduced DSLO price, IBM sends only one copy of the software, maintenance tapes and manuals. Thus, for the D60/70 configuration, you would get installation tapes and subsequent maintenance tapes only for the D70 and would apply them to your D60 as well.

If you have both machines at the same installation, having one set of software tapes to manage is less complicated than receiving a set for each. If the machines are remote from each other, you can duplicate the software with IBM-supplied utilities and have a set for each site. You can always order additional manuals.

### Application costs

Now you have two AS/400s with as much combined power as a D80 for about the same, or lower, price. By buying packaged application software, you have an opportunity for even more savings. Because vendor software is usually priced according to the size of the machine on which it runs, it will be less expensive to buy packages for two smaller machines than for one large machine.

Let's say, for example, that in your dual-machine installation, the D60 has been outfitted as a finance and accounting machine, while the D70 is set up as an order processing/distribution/manufacturing machine.

The D60 would run applications such as accounts payable, accounts receivable, general ledger, payroll, cash management and cost accounting. Each piece of software costs approximately $30,000, except for the cash management application, which is priced at about $18,000. (Cost is based on the prices charged by a major AS/400 software vendor.)

The D70 would run order processing, distribution, inventory control, manufacturing resource planning (MRP), production scheduling and shop floor control applications, each of which costs about $45,000. Using these figures, the combined costs for the two machines' software is $483,000.

As for the D80, it has to take on both sets of applications. The price for each package is $60,000, except for cash management, which is $36,000. Total cost: $756,000.

The purchase price of the software for the D60/70 combination is more than 30% less than that of the single D80. Furthermore, software maintenance charges (figured at 12% per year) are $90,720 for the single-unit configuration and $57,960 for the dual configuration, a savings of 30% per year.

Depending on how much application software is purchased, these savings can overwhelm any differences in hardware and system software costs between a dual-machine and a single-machine configuration.

You'll find that these savings do not stop at the comparison of the D60/70 combination vs. the D80. It turns out that across the entire AS/400 product line, the cost of dual machines compares favorably with that of a single-machine installation, with the reduced cost of application software making the former setup even more attractive.

When you divide the work load even further — separating tasks onto three machines — the economic advantages continue. The combined RAMP-C performance of three model D45s can be economically used in place of a single model D70, for example.

One D45 could be configured to handle accounts payable, accounts receivable, general ledger, payroll, cash management and cost accounting; a second could handle order processing, distribution and inventory control; and a third could take on MRP, production scheduling, shop floor control and purchasing.

Hardware and system software can be acquired for 5% less than the cost of a single machine (see chart at left).

When you look at the savings available from buying application software for three smaller machines instead of one large machine, the differences become even more dramatic: The application software costs for the three-machine model D45 installation is less than half the expense of the model D70 amount. The total dollar savings for hardware, system software and application software is almost a half-million dollars; in addition, there is a savings of more than $30,000 per year in application software maintenance costs.

One brokerage company in the U.S. knows only too well that such savings are real. It established a nationwide network of AS/400s in its manufacturing plants while managing data and applications development on a centralized basis. This approach replaced mainframe service previously provided by another corporate division. Expected savings? Approximately $1 million per year. •

### Two machines can be better than one

*A D60/D70 combination may be better than a single D80 in terms of price/performance*

| AS/400 model | D60 | D70 | Combined | D80 |
|---|---|---|---|---|
| Hardware cost[1] | $1,196,260 | $1,378,260 | $2,574,520 | $2,676,310 |
| Software cost | $181,457 | $236,082 | $417,539 | $310,862 |
| DSLO savings[2] | | | ($21,797) | — |
| Total cost | | | $2,970,262 | $2,987,172 |
| **Other costs** | | | | |
| Monthly maintenance | $3,438 | $3,598 | $7,036 | $6,657 |
| Application software costs | $168,000 | $315,000 | $483,000 | $756,000 |
| Software maintenance (12% per year) | | | $57,960 | $90,720 |
| **Features** | | | | |
| RAMP-C performance | 8.3 | 11.2 | 19.5 | 19.8 |
| Memory | 160M bytes | 224M bytes | 384M bytes | 384M bytes |
| DASD | 41.15G bytes | 41.15G bytes | 82.3G bytes | 82.3G bytes |
| Reel-to-reel tape | one 9348 | one 9348 | two 9348s | one 9348 |
| Communications lines | 16 | 16 | 32 | 32 |
| Token Ring adapters | 1 | 1 | 2 | 1 |
| Workstation controllers | 10 | 10 | 20 | 20 |

[1] Does not include printers, terminals, PCs, PS/2s or cabling.
[2] Savings associated with using the Distributed Software Licensing Option (DSLO) for multiple machines.

Source: International Systems Services Corp. CW Chart: Janell Genovese

### Three's a charm

*Three model D45s can offer price benefits over a single D70 without significant loss in performance*

| AS/400 model | D70 | Three D45s |
|---|---|---|
| Hardware cost[1] | $2,038,150 | $1,870,710 |
| Software cost | $237,278 | $303,996 |
| DSLO savings[2] | — | (26,904) |
| Total cost | $2,275,428 | $2,147,802 |
| **Other costs** | | |
| Monthly maintenance | $5,312 | $5,697 |
| Application software costs | $567,000 | $252,000 |
| Software maintenance (12% per year) | $68,040 | $30,240 |
| **Features** | | |
| RAMP-C performance | 11.2 | 11.1 |
| Memory | 240M bytes | 240M bytes |
| DASD | 72G bytes | 72G bytes |
| Reel-to-reel tape | one 9348 | three 9348s |
| Communications lines | 24 | 24 |
| Token Ring adapters | 1 | 3 |
| Workstation controllers | 24 | 24 |

[1] Does not include printers, terminals, PCs, PS/2s or cabling.
[2] Savings associated with using the Distributed Software Licensing Option (DSLO) for multiple machines.

Source: International Systems Services Corp. CW Chart: Michael Siggins

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# How to link your AS/400s

*A practical set of guidelines to physical, logical and data connections*

BY FREDERICK P. CLARK

Once you have your multiple AS/400 machines and you've installed your application software, how do you get the machines to work together? Savings can start only after the connection is made.

The way to interconnect AS/400s on a local basis is via a 16M bit/sec. Token Ring network (see chart below). A physical Token Ring network is just an IBM 8228 Multi-station Access Unit, which lists for about $750. Other vendors make comparable equipment.

The connected machines do not necessarily need to be physically close together. The devices on a Token Ring can be located some distance apart, depending on type of cabling used, number of network nodes, whether repeaters are used and so on.

While the Token Ring does not enable you to connect far-flung locations such as Seattle and Miami on the network, it is a good approach for local connection.

It is worth emphasizing that the 16M bit/sec. Token Ring is a fast telecom connection and provides machine-to-machine communication that can be comparable to the speed of having everything on one machine.

Machine connections can also be made remotely via telecom lines using AS/400 protocols such as Synchronous Data Link Control, X.25 and so on, but performance will depend heavily on your choice of line speed.

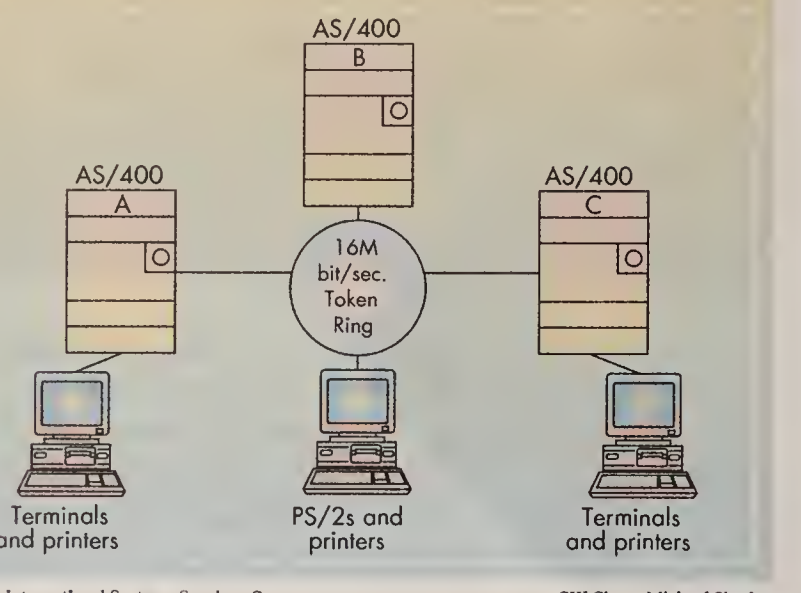
Once you've completed the physical connection, you can configure each AS/400's operating system software for the Token Ring with a line description, one or more advanced program-to-program communications (APPC) controller descriptions and one or more APPC device descriptions.

The line and controller descriptions are created using the CRTLINTRN as well as the CRTCTLAPPC commands, respectively, on each AS/400. The easiest method to create APPC device descriptions is through the AS/400's autoconfiguration feature, in which the machines configure on their own.

There may be security and/or naming convention reasons for creating your own device descriptions and not using the autoconfiguration feature; however, with AUTOCONFIG, once you vary-on (activate) the line, controllers and devices, you're connected.

**The physical connection**

*A possible way to connect your multiple AS/400s*




Source: International Systems Services Corp. CW Chart: Michael Siggins

### The data connection

You can now use the physical and logical AS/400 connections to share direct-access storage device files and share work among machines. That's what distributed computing is all about.

There are three ways you can read/update a file from the AS/400 on another machine as if it were local data: 1) APPC with intersystems communication function (ICF) files; 2) distributed data management (DDM) files; and 3) remote unit of work (RUOW) with SQL.

• **APPC with ICF files.** With this approach, you write your own remote I/O and access programs, which communicate with one another through "dummy" devices represented by the ICF files. When your application uses these programs and ICF files, it must establish a conversation, which sends I/O requests to the program you've written on the remote machine.

This approach is very specific, allowing a precise definition of what needs to be accessed and how. It is therefore the most difficult approach to modify, but when well written, it is efficient.

For example, you could write an inventory program that would accept a machine part number as input from a display terminal. The program would determine which of your warehouse's multiple AS/400s to send an inquiry to for an inventory balance.

The target program on another machine would receive the request, look up the inventory and return the data to the requesting program on the original machine.

• **DDM files.** The tremendous advantage of DDM is that it is simple to set up, simple to use and simple to modify. You create a DDM file on the source system using the CRTDDMF command. This DDM file definition has in it the remote location name of the target machine plus the library name and file name as they exist on the target.

Your program on the source machine uses the DDM file name the same way it would use a local file, and the AS/400 connections take care of the rest, without the application having to worry about it. The source system's DDM file names functions as an alias of the target file, with the operating systems sorting out where the data really is.

Using DDM, you could write a program that would accept a machine part number as input from a display terminal. The program would then request an inventory record from a file for the part number. The operating system would then take care of retrieving that record from the AS/400 that has the file and would provide the record to the requesting program for further processing.

Because DDM is record-at-a-time-oriented and passes entire data management requests and responses from one machine to the other, the transmission volume is larger and the performance may be slower than a precisely designed APPC/ICF combination. For random record retrievals and updates, it can work well; for file transfers, however, it is sluggish.

For situations that require synchronizing the integrity of updates to multiple files, commit and rollback processing is provided as an integral part of the OS/400 operating system. At present, it is available for files on source machines only. IBM is expected to make remote commit and rollback processing available for use with DDM files in Release 1.1 of OS/400 Version 2 in March 1992.

In the case of updating remote files that do not require synchronization through commit and rollback processing, you can use available APPC/ICF and DDM remote access procedures. Where file synchronization and commit/rollback processing is required, you must take careful application design and back-up/recovery procedures into consideration until OS/400 Version 2 Release 1.1.

• **RUOW processing.** RUOW processing allows the use of SQL statements in a source system's application to access SQL tables (files) on a target machine; the SQL processing plus commit and/or rollback features are executed on the target system as a unit of work. From the application's point of view, the remote tables appear as if they are local.

RUOW requires the use of SQL. It can access only one remote machine in each remote access request, although successive RUOW requests could access different machines.

RUOW will be available in OS/400 2.0, as will commit and rollback processing for RUOW. •

## Breaking loose from small-machine barriers

While use of multiple smaller machines offers companies valuable benefits, there are some limitations to the divide and conquer approach to machine sizing. But you can get around them.

▶**Limit:** The upper capacity bounds of smaller models may prevent a group of machines from providing the total connections and number of peripherals required, even though throughput is adequate.

▶**Response:** In such cases, you should think carefully about which application loads to combine on a slightly larger machine to minimize computer resource competition and service-level impact.

▶**Limit:** From an applications design standpoint, a multiple-machine setup provides commit and rollback support for only one remote file or one remote database at a time. Support for commit and rollback processing of multiple remote files and/or databases requires Distributed Unit of Work, a feature not expected until 1994.

▶**Response:** In the meantime, careful application planning coupled with active data administration principles will enable you to make the most of existing capabilities and their associated benefits.

▶**Limit:** Some will argue that with a multiple-machine installation, more overhead (disk space, CPU and memory) is consumed just to run multiple operating systems and program products. It is true that three copies of OS/400 and all the other licensed programs will take up three times as much disk space on three machines as one copy on one large machine. Three times as much memory will be required to run three copies of all the subsystems, to manage three duplicates of user profiles and all other system objects. They will gobble up three times as much CPU time while managing three machines.

▶**Response:** If your machines are configured in keeping with the RAMP-C maximums or, more effectively, in accordance with a capacity-planning model, this additional overhead will be a theoretical disadvantage, not a practical one.

What matters most of all is work load throughput. With proper capacity planning, modeling and preferably benchmarking of your business work loads, adequate performance can be ensured, regardless of how the machine actually accomplishes it under the covers.

FREDERICK P. CLARK

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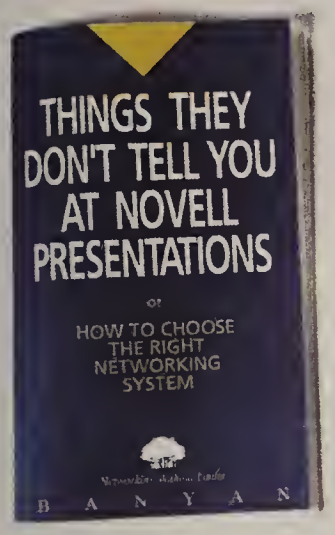


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## PPG passes on IS baton

▶ **PPG Industries, Inc.** makes industrial glass, automotive coatings, architectural finishes, specialty chemicals and medical electronics. One thing the $6 billion firm doesn't deal in is information technology — as of early this month, it leaves that up to **Electronic Data Systems Corp.** The Philadelphia-based industrial products vendor and the Dallas-based outsourcing player signed a 10-year, $34 million outsourcing agreement.

## Just our Bill

▶ He turned up as No. 2 on *Forbes* magazine's list of the richest people in the U.S., but **Microsoft Corp.** Chairman and Chief Executive Officer **William Gates III** can probably count on being Numero Uno in the eyes of the **University of Washington.** A $12 million gift from the computer executive — said to be the largest single pledge the institution has ever received from an individual — will establish a department of molecular biotechnology in the university's medical school. The donation will also endow the new department's chair, which will be filled by **Leroy "Lee" Hood** of the California Institute of Technology.

## Counterclaim

▶ In the dog days of summer, **Digital Equipment Corp.** sued **Emulex Corp.**, alleging that certain of Emulex's disk/tape interconnect wares infringed on DEC patents. Now the Costa Mesa, Calif.-based storage and networking products vendor is biting back. Last week, Emulex filed a countersuit charging DEC with unfair business practices meant to eliminate competition in the DEC-compatible products market.

## The heat is on piracy

▶ Once, "pirates in the movie industry" meant Errol Flynn and John Barrymore; today, the swashbucklers are gone and the copyright violators have moved in. Late last month, representatives of motion picture industry trade associations met with their counterparts in computer software to discuss joining forces against the common foe. The **Copyright Conclave** hopes to be heard in Washington, D.C., said Eric Smith, general counsel of the attending International Intellectual Property Alliance.

# Videoconferencing, CLI poised to soar

BY CLINTON WILDER
CW STAFF

When the Bank of Commerce and Credit International scandal hit the news recently, executives at Visa International entered a room in San Mateo, Calif., every morning to share the latest developments and concerns with Visa's European executives, gathered in a similar room in London. Their tools for dealing with the breaking events were crisis management skills, business acumen and videoconferencing technology.

"It was very effective in helping us stay on top of a very volatile situation," said Roger Peirce, Visa's executive vice president of international delivery systems. "For multinational companies, it's going to become a way of doing business."

Videoconferencing system vendors hope Peirce is right — and most market forecasts suggest he is. Market growth forecasts range from about 25% annual growth to more than 60%, with most research firms projecting the market to hit $1 billion by the middle of the decade.

This is all good — though not surprising — news in San Jose, Calif., home of market leader Compression Labs, Inc. (CLI). Although challenged at the low end of the videoconferencing market by fast-growing Picturetel Corp. in Peabody, Mass. [CW, Dec. 17, 1990], CLI continues to grow handsomely and maintain its market share (see chart). Research firms each define the market differently, but most give CLI a share between 35% and 45%. The firm expects to reach $70 million in revenue this year, which would be about 40% sales growth over 1990.

The hype surrounding videoconferencing has been around for about 25 years, since the first prototypes of AT&T's original Picturephone appeared in the mid-1960s. But developments late last year have spurred the potential for real market growth, analysts said.

This list of developments was not headed by the corporate restrictions on and nervousness about business travel during the Persian Gulf crisis, as many believe. Rather, the key events were technology developments: the offering of better, cheaper and more flexible digital communications capabilities by long-distance carriers AT&T, MCI Communications Corp. and U.S. Sprint Communications Co.

"Until late 1990, most videoconferences were run over private networks, but that is changing," said Mark Lowenstein, senior analyst at Boston-based market research firm The Yankee Group. "When you have switched digital services available from 56K bit/sec. all the way up to switched T1 on public networks, it really opens up the market. It's no longer the exclusive domain of the Fortune 500."

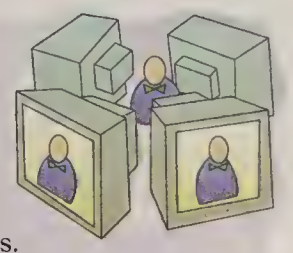
CLI's most recent major product introduction was a videoconferencing system — a so-called coder/decoder (codec) — designed to take advantage of that flexibility. The Rembrandt II/VP system is the first codec that lets the user choose how much bandwidth to use for a particular videoconference: a basic cost vs. quality business decision.

"If you're running a meeting with an outlying sales office, a low-end 56K bit/sec. transmission may be sufficient," CLI President John Tyson said. "But if the senior vice president in Dallas wants to address 15 people in Seattle, you might want 768K bit/sec. or T1 [1.55 M bit/sec.]."

In addition to Visa, CLI's customers include The Boeing Co., IBM, General Electric Co., Hew-

*Continued on page 101*

### Set for more of a bigger market



*Growth in sub-T1 videoconferencing—CLI's forte — is projected to outstrip growth in and above T1 during the early to mid-1990s, driven by the following:*

- Worldwide acceptance of relevant standards.
- Increasingly available cost-effective networks.
- Decreasing cost of equipment.
- Increasing quality of image and voice delivery by video codes.
- More effective integration of videoconferencing equipment into other office and home communications systems.

Source: Telemanagement Resources International, Inc.

**U.S. videoconferencing equipment revenue** (in millions)

Source: Forrester Research, Inc.

CW Chart: Janell Genovese

# Unisys spin-off seen as money-making venture

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Evidently unable to find a buyer willing to pay an acceptable price for its defense division, Unisys Corp. last week initiated a public stock offering for the unit in hopes of raising up to $832 million.

A portion of these proceeds will go to relieve Unisys' crushing debt load, which stood at $3.8 billion at the end of the second quarter for the $10.1 billion company. How much of the amount raised will be used to pay down the debt was not disclosed.

The 17,000-person defense group, Paramax, Inc., will be headed by Frederick F. Jenny, the current president of the McLean, Va.-based division.

Unisys has never confirmed it had sought a buyer for the defense unit. However, analysts have believed for several years that the group was for sale.

Jettisoning the defense group will have zero impact on Unisys' computer business, said Rick Martin, an analyst at Prudential Securities, Inc. in New York.

"I don't think it matters one bit. There was no technology sharing, R&D, manufacturing or marketing between the two [businesses]," he said.

Martin said the key issue for the computer group is how to get its distributed systems — which include its multiuser CTOS line, Unix servers and personal computers — out of the red.

Other observers, however, think the divestment of the defense group could be significant. This is a signal for Unisys' intention to find a foreign partner.

Last June, Unisys agreed to sell $150 million worth of preferred stock to Mitsui & Co. That stock is convertible to 4.6% of Unisys common stock.

"They want to open the door for more investment from Mitsui, which was limited to 5% as long as they had the defense business," said George Lindamood, an analyst at Gartner Group, Inc. in Stamford, Conn.

In Lindamood's scenario, Mitsui will invest directly in Unisys or act as a matchmaker between Unisys and Toshiba Corp.

"As I look at the computer industry five and 10 years out, I don't see room for all these players to survive," Lindamood said. A partnerless Unisys "may not make the cut," he added.

In its filing with the Securities and Exchange Commission, Unisys said it would issue 20 million shares of stock at an expected price of $22 to $25 per share.

If Unisys receives that price, it stands to gain $440 million to $500 million. Unisys will receive an additional $332 million from Paramax in exchange for various assets. Paramax will obtain this cash from lenders.

The defense group, with $2.18 billion in revenue, generated about one-fifth of Unisys' $10.1 billion revenue last year.

Still, observers agreed it was a lousy time to bring a defense company to investors, given the Bush administration's disarmament announcements.

In related news, Unisys' financial subsidiary last week sold $41 million of tax-exempt lease-backed certificates. Sale proceeds will help pay down the firm's debt, a spokesman said.

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# IBM, seeking trim, top-notch staff, sets new standards for personnel

BY NELL MARGOLIS
CW STAFF

ARMONK N.Y. — Updating its employee performance evaluation guidelines for the first time in 20 years, IBM early this month effectively told its U.S. employees to pull their weight or pack their bags.

The tighter, tougher review process, an IBM spokesman said, was conceived and will be implemented as a quality assurance move — not as a prod to urge employees out the door.

Even so, he said, some employees who draw poor assessments in the new ratings are likely to leave.

IBM, battling depressed earnings and shrinking margins as it attempts to reposition itself as a services firm, has made no secret of the need for a corporate slimming. IBM executives have on several occasions confirmed the company's expectation that it will shrink by 17,000 employees this year.

The new "Employee Planning, Counseling and Evaluation Process" makes two key changes to the 20-year-old status quo, according to IBM spokesman Jim Ruderman.

A renewed emphasis will be placed on ranking employees within peer groups, he said. Also, a set of common attributes — dependability, adaptability and the ability to learn new skills and to communicate effectively — will be used to measure the performance of each employee.

The goal is to identify and reward employees who are putting in the best efforts and identify and deal with those whose performance is lagging, Ruderman said. One analyst said that while the pursuit of quality is admirable, IBM should tackle its quantity problems. "I'm afraid [the performance review tightening] is just a continuation of IBM's reluctance to face up to its real problem," said Robert Djurdjevic, president of Annex Research in Phoenix. "It's another in a series of cosmetic changes they've been making instead of restructuring the company entirely."

# Mass is key to play in Europe

BY COMPUTERWOCHE STAFF
IDG NEWS SERVICE

DUSSELDORF, Germany — A major computer firm must have annual revenue of at least $24 billion to survive in the long term.

So said Gerhard Adler, managing director of market research group Diebold Deutschland GmbH. And on the eve of the January 1992 opening of Europe, he added, European computer firms come nowhere near this target.

"I think Olivetti is in danger," Adler said. Italy's Ing. C. Olivetti & Co., he said, has focused on producing small machines in large numbers — a market Japan dominates.

Europe's leading computer firms are grappling with the same issues of mounting global competition and major product line turnarounds that currently confront firms the world over; at the same time, however, they are taking a quantum leap into the corporate unknown on what was formerly secure home turf.

"We're leaving a citizenship [behind] and acquiring a new one," Vittorio Cassoni, managing director of the Olivetti Group, told attendees at the recent International Data Corp. European Industry Conference in Venice. "We don't know what it's like to be European."

Germany's Siemens-Nixdorf Informationssysteme AG and France's Groupe Bull appear to be better candidates for survival, Adler said — but only under certain conditions.

"Siemens-Nixdorf desperately needs to gain a foothold in the U.S. market," he said. Executives at the firm have confirmed that it is striving to do exactly that.

"One of Bull's advantages is that it is already present in the U.S.," Adler noted.

Siemens-Nixdorf can best achieve its goal by finding a U.S. partner, Adler said. Small companies could not provide the necessary backing. He said a link with NCR Corp. would have been feasible, but that firm has merged with AT&T.

Adler encouraged hardware companies to focus seriously on the software sector because in the future, companies will be differentiated less by their computers than by their software.

European companies cannot avoid seeking strong partners, given that the industry has matured and manufacturers must adjust to this change. As a result, the market is becoming polarized into major firms that are active worldwide and small firms that operate in niches, Adler said.

Computerwoche *is an IDG Communications German publication.*

## INTERNATIONAL BRIEFS

### European tour

▶ **Digital Equipment Corp.**'s first foray into Eastern Europe — **DEC Hungary**, opened in 1990 — has given Hungary its fastest growing computer company, and similar ventures in **Germany** and **Czechoslovakia** are growing apace. What more reason could DEC need to take its successful formula to **Poland**? None, apparently: **DEC Poland**, based in Warsaw, is expected to be up and running early next month, the company announced last week.

### MITI proposal

▶ Japan's **Ministry of International Trade and Industry (MITI)**, the powerful force behind the nation's successful technology drive, is working out the details for a project that would develop **Unix** utility software programs that support functions of the operating system. The ministry declined to confirm specifics of the as-yet-unofficial project. However, a report in the *Jiji Press* in Tokyo quoted a ministry source as saying MITI would ask the Japanese government for an approximately $3 million budget for the first year of the four-year development initiative to be carried out by both Japanese and overseas corporations and universities.

# CLI

CONTINUED FROM PAGE 99

lett-Packard Co. and Sears, Roebuck and Co.

CLI is reorganizing as it expands in new directions. It has formed a separate unit devoted to new markets, which run the gamut from potential personal computer-based "videoconference in a window" applications to tapping into high-definition TV technology at rates up to 45M bit/sec.

**CLI's Tyson:** *The firm is expanding to fill new markets*

While Picturetel has carved out its successful niche at the low end, "CLI sees its world as the whole spectrum," Tyson said. Unable to resist a swipe at CLI's arch-rival, he added, "If you want single point-to-point communication and price is a big factor, you're probably going to buy Picturetel."

Could branching out into several new potential markets mean that CLI might spread itself too thin? "That concern has been raised by a number of analysts, but I don't think so," Lowenstein said. "Videoconferencing is still their bread and butter, and they're leveraging their compression technology for other business opportunities. They haven't adversely affected their core business." If other customers develop their use of videoconferencing the way Visa has, CLI and other vendors will have little to worry about.

The credit card giant installed a CLI system about two years ago to hold meetings between its processing centers in San Mateo, Calif., and McLean, Va. It has added videoconferencing rooms in London and Miami, as well as two more in San Mateo, and is building others. The rooms are designed with trapezoid-shaped tables to make users comfortable with the technology.

"You're not so focused on the fact that it's a videoconference; it's just another meeting," Peirce said. "When we looked at the challenges we face in the future as a global corporation, we decided videoconferencing was very important for us."

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Pat Walker,
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COMMENTARY

*Lori Valigra*

# Another shot in the foot

With its recent decision to slap a 62.67% tariff on imports of Japanese active-matrix LCDs, which are used in state-of-the-art portable computers, the U.S. government threw another block at Japan to obtain its much-vaunted level playing field.

But the Japanese companies just shifted their weight, avoided the punch and continued about their business.

Toshiba, a major maker of portable computers using the displays, has already said it intends to replace exports of the component screens to its U.S. plant with complete computers made in Japan. NEC and others are expected to follow suit.

Toshiba has been quoted as saying that it will soon start shipping to the U.S. about 2,000 laptops per month with color displays. Those products would otherwise have been made at the company's California plant.

Ironically, it was the imposition of other penalties in 1986 that first drove the Japanese to manufacture computers in the U.S. At the time, the two countries were involved in a semiconductor trade dispute. The U.S. accused Japan of dumping certain components and slapped 100% import duties on laptop computers and other products incorporating the components in question.

The erasure of the 100% import duties when the bilateral semiconductor accord was renewed this past July gave Japanese companies reason to consider moving production back home. The new tariffs on LCDs virtually forced them to reabsorb manufacturing in Japan.

The potential loss of U.S. jobs isn't the only issue. The ability of the U.S. to compete is at stake.

While Japanese companies, which lead in the screen technology, can now save money on tariffs by exporting entire products, U.S. makers will have to pay more to buy the screens to put into their newest products.

Apple Chairman John Sculley has been a vocal opponent of the tariffs: His company is relying on the screen technology to make a more powerful Macintosh portable a reality. At a speech last year in Tokyo, Sculley criticized the sort of political shortsightedness that trades off short-term retribution against a small number of firms for the long-term technological prowess of a larger number of firms.

Dumping and other unfair trade practices that harm U.S. industry should not be tolerated. But certainly U.S. trade representatives and policymakers could have reached a better compromise between the borderless world of technocrats and the toll bridges of governments — a compromise that would have been a shot in the arm to industry rather than a shot in the foot.

*Valigra is the Tokyo bureau chief for the IDG News Service.*

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# Wang fills its chief tech post

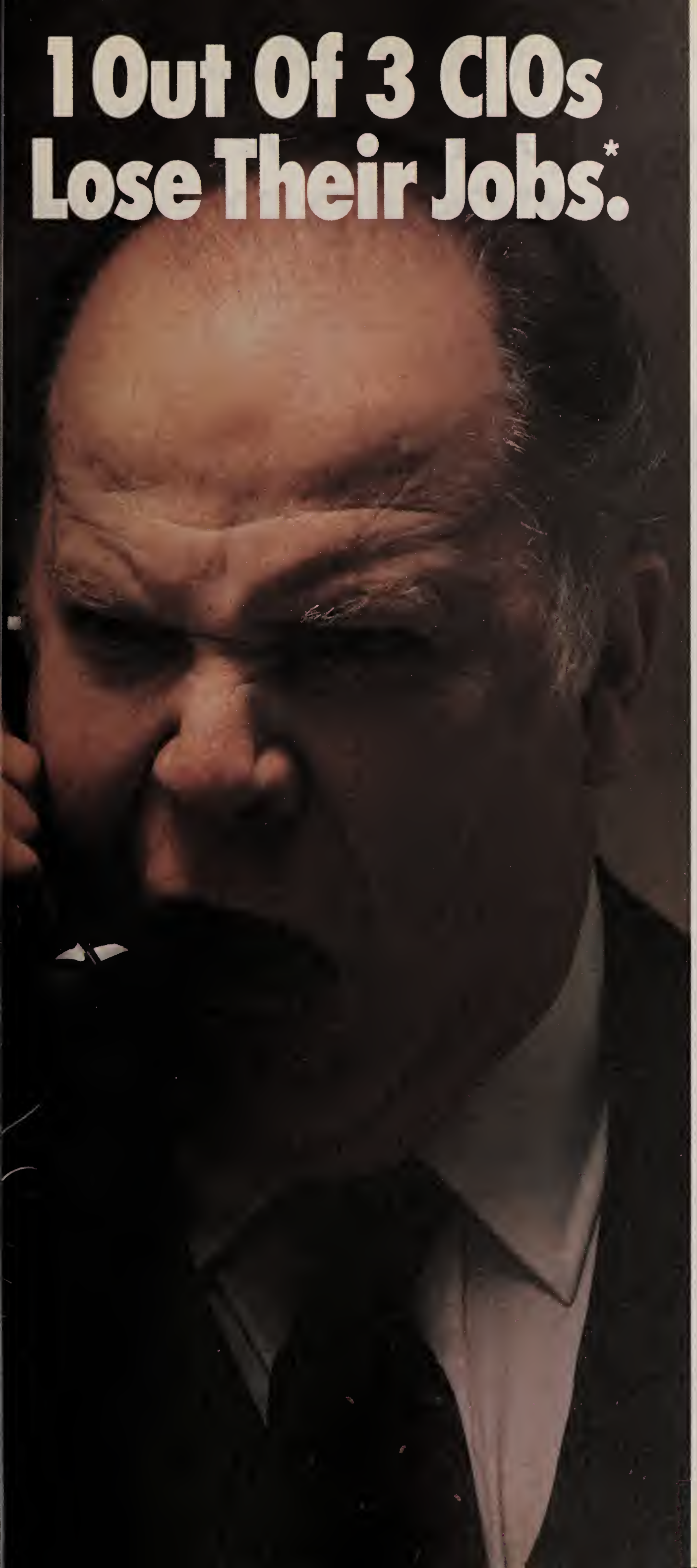
**Wang Laboratories, Inc.** early this month dipped into the management of Lotus Development Corp. to hire **Donald P. Casey** as vice president and chief development officer. As Wang Labs' chief technology official, Casey fills the vacancy that was left by **Horace Tsiang,** who resigned from the firm in July.

Prior to his work at Lotus, Casey was an executive at **Apple Computer, Inc.** and **IBM.** In his new position, he will report directly to Wang Chief Executive Officer **Richard W. Miller.**

**Michael J. Winkler,** former vice president of worldwide printing systems at **Xerox Corp.,** has been named vice president and general manager of the Computer Systems Division at **Toshiba America Information Systems, Inc.** Winkler, a 23-year veteran of the office automation industry, is credited with helping to spearhead the Total Quality Management program that won Xerox the Malcolm Baldrige National Quality Award in 1989.

Toshiba America also announced that **Kenichi Yokoo** has been named executive vice president in charge of four of the firm's office automation divisions. Previously, Yokoo served as president of the Industrial Electronics Sector of **Toshiba Canada Ltd.** His appointment to the post at Toshiba America, company President **Kiichi Hataya** said, is a move designed to further strengthen the company's automated office products marketing and manufacturing operations.

# 1 Out Of 3 CIOs Lose Their Jobs.*



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# Mainstreaming doesn't happen in a day

BY EMILY LEINFUSS
SPECIAL TO CW

After 20 years at The Travelers Corp.'s central information systems department in Hartford, Conn., David Reynolds transferred to a regional business office two years ago. The move took him all the way across the country, to Walnut Creek, Calif., and transformed his working life.

Although his title is now director of technology, Reynold's new position has turned out to involve considerably more than overseeing IS. He's now performing general management functions such as account management and case eligibility analysis; tasks he learned about by developing the systems to support them.

This has been a change from what he was used to, Reynolds says, but a change for the better. "I'd do it again in a minute."

Like Reynolds, many IS professionals find that moving to user departments provides the opportunity to round out technical skills by getting more involved in a company's business activities. However, this kind of transfer isn't always smooth.

Decentralization is not for everyone, says Linda Frigo, manager of IS at Inland Bar Structural Co. in East Chicago, Ind. Many of the IS professionals at Inland do work in business departments, she says, but that kind of assignment isn't likely to suit people who want to work in areas such as performance tuning and systems programming.

Nancy Winslow, a systems analyst in customer service support at Florida Power & Light Co. in Miami, doesn't fall neatly into Frigo's categories, but she admits to mixed feelings about moving from central IS six months ago.

"I miss the new technology that they are learning within the IS department. You don't get that in the business unit."

Despite that feeling of being far from the cutting edge, Winslow says the move to the business unit was good for her. "Now I work on systems that the business people actually use with the customer. That has broadened my horizons," she says.

### Apples and oranges

One of the key problems for IS workers who move to a business unit is getting their new managers to understand their professional needs, says Kay Lewis Redditt, a consultant at Cognitech in Easton, Conn. Cognitech recently completed a study of IS dispersal for the Society for Information Management, examining 48 business units at 20 firms.

Redditt says IS workers are accustomed to a completely different kind of culture and have different operating expectations than business staff has. They also need substantially more ongoing training, which business managers often don't understand. "In an IS environment, goals are based on getting systems delivered, being on time and on budget," Redditt says.

### First time around

The Cognitech study shows that issues surrounding decentralization must be addressed by management in the beginning stages. For example, Redditt says, a Canadian bank that moved a whole development group into a business unit abandoned its attempt because the IS people created their own fortress within the department. The bank tried again two years later, but this time, it was careful to create a more open space where business and IS people could mix.

Reynolds concedes that trying to fit into the culture of a business unit can be intimidating. "They use a whole different set of lingo than you. In many cases, their knowledge of business is far better than yours. You need to acquire all that to be on equal footing," he says.

Reynolds learned Travelers' business by attending a number of in-house presentations on company products and by doing a lot of reading. Learning about the business isn't the same thing as fitting into the flow of the business, however. Even after learning the terminology and the product line, Reynolds found he was still thinking about the work process in a way that was foreign to his new setting.

Reynolds says he had to change his project-oriented way of thinking to fit into the business culture. "In IS, the work is mostly project-related. There is a finite start and end to most of the work. You don't have much of that on the business side. There, the work is an ongoing process."

Leinfuss is a free-lance writer based in Sarasota, Fla.

## Best of both worlds

One means of easing many of the pains decentralized professionals suffer is for companies to maintain a central IS function to handle training, career development and compensation needs.

At Merrill Lynch & Co. in New York, the applications development employees reside within the business units. However, the firm has set up a central organization to manage the information technology area. "The central, functional organization handles all the needs of the professionals in terms of training, education, tools and career planning," says Howard Sorgen, senior vice president and chief technology officer.

It is critical to provide continuing education and some form of career connection for dispersed IS staff members, says Ray Hoving, director of MIS for the Process Systems Group (PSG) at Air Products & Chemicals Corp.

While IS is decentralized at Air Products & Chemicals, IS career paths, training and compensation issues are handled by a central IS organization, says Hoving, who was moved to PSG two years ago.

This central group meets regularly with business unit managers and reviews IS staff progress with an eye toward career development and equitable compensation. The group also moves IS professionals from one business organization to another in order to promote them and to increase their overall business knowledge, Hoving says.


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# Pursuing foreign employment

*Fast Track is a twice-monthly column dedicated to answering questions on career directions.*

BY MAX MESSMER
SPECIAL TO CW

**Q I have a B.S. in computer science and math and management experience at a large aerospace company, and I am fluent in Spanish. How can I find information on job opportunities in Central and South America?**

*E. T.*
*Seattle, Wash.*

A If you have already checked for possibilities within your current organization, your next move should be to look at other companies in your industry that may have substantial operations there. Don't limit yourself to the well-known U.S. multinationals.

You can also speak to the consulates of the countries you are interested in to see if they have any job listings.

**Q I am an information systems student researching career options. Testing indicates that I am best with "people and data." I've been advised not to go to graduate school for an IS degree because that field will not give me enough contact with people. What IS careers are more people-oriented and interactive?**

*S. B.*
*Austin, Texas*

A IS people have to work and communicate well with users to be successful, but entry-level IS jobs still require good technical skills. If you do not go on to graduate school, develop a technical specialty through study or part-time employment. Look for something that will give you both a technical edge and experience in working with users. For example, both C++ and Apple Computer, Inc. Macintosh network administration are good specialties, but a Macintosh administrator is likely to have much more user contact than a C++ systems programmer.

FAST TRACK
CAREER ADVICE FOR THE '90s

**Q I have worked in the cable television field for about 10 years, and I have a little experience with local-area networks. However, I am having trouble finding employment in either that industry or that specialty. What type of schooling do I need?**

*K. W. B.*
*Jax, N.C.*

A You might consider studying to become a Certified Novell Engineer. About 80% of all personal computer LANs are Novell, Inc.-based, and Novell engineers are in demand in most parts of the U.S. The program, which is offered in major cities on a regular basis, requires six months of study and successful completion of an examination.

You might also investigate going to technical school to study broadband or optical fiber circuitry. Broadband and optical fiber are the cabling systems of the future for delivering video into homes and offices.

**Q I'm a programmer/analyst at a large food service company, and I recently received my MBA. I've been offered an opportunity to move into management, and I'm going to take it. I'm wondering, however, how much energy I should spend keeping my technical skills up to date in case this job doesn't work out?**

*Initials and town withheld*

A You're not likely to lose your technical edge in the year or two that it will take you to learn whether management is for you. Concentrate first on learning the people skills and the details of the food service business that you'll need to be a successful manager.

---

Messmer is chairman of Robert Half International, Inc., which places permanent and temporary IS professionals in the U.S. and abroad.

*We welcome your questions. Send them to Cathy Duffy, Careers Fast Track,* Computerworld, *375 Cochituate Road, Framingham, Mass. 01701, or fax them to (508) 875-8931. Letters may be edited for brevity and clarity. Your initials and town will be printed unless you request otherwise.*

JOB SNAPSHOT

## LAN administrators

▶ **JOB REQUIREMENTS:** The types of skills required for a local-area network administrator vary considerably, depending on the size of the shop. In large companies, the job usually entails keeping the network running, supporting users and assisting in the development of shared applications. In a small firm, a LAN administrator may also be responsible for designing and installing new LANs. LAN administrators must be detail-oriented in order to keep track of constantly changing network configurations. Some coding background is helpful to create batch files or C routines.

▶ **CAREER PLUSES:** LAN administrators say you will never get bored: They work with a wide variety of applications and systems, and the technology changes every day. This is also a wonderful post for obtaining a broad education in many aspects of technology.

▶ **CAREER MINUSES:** LANs and LAN administration are relatively new territories, which sometimes makes this position politically difficult. Because few people understand what a LAN administrator does, job descriptions are often vague and LAN administrators tend not to get the level of salary or respect afforded other positions with similar levels of responsibility. LAN administrators admit this is changing, though, as more and more companies make LANs a mission-critical part of their business.

▶ **BEST JOB OPPORTUNITIES:** Working with a network systems integrator or reseller is an excellent way to get a fast start in the field, with exposure to a wide variety of systems and configurations. Banks, financial institutions, insurance and health care companies are all seen as strong employment prospects because they use a high percentage of mission-critical LANs.

▶ **RECENT CHANGES:** Both the recession (which has generally tightened budgets and forced LAN administrators to cover more ground themselves) and increasing sophistication in networking technology have made LAN administrators' jobs more complicated. It's not enough anymore to just understand the network operating system; they must also be familiar with OS/2, windows, client/server, Transmission Control Protocol/Internet Protocol, wiring hubs and more.

*Researched and written by Kathleen Gow, a free-lance writer based in Medford, Mass.*


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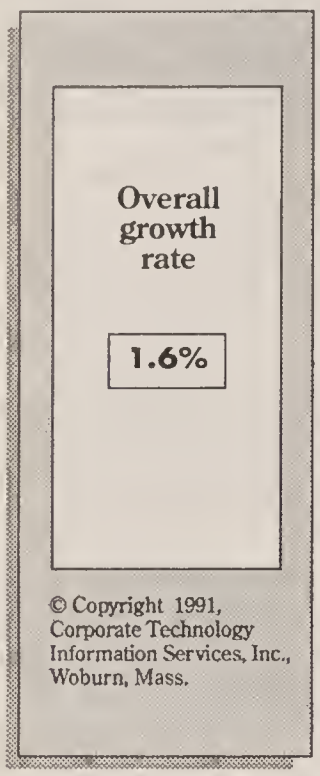


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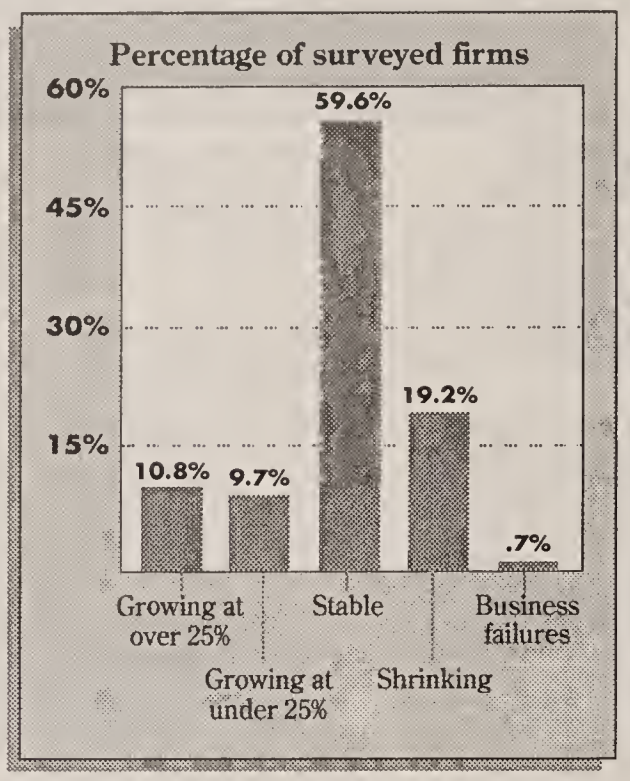


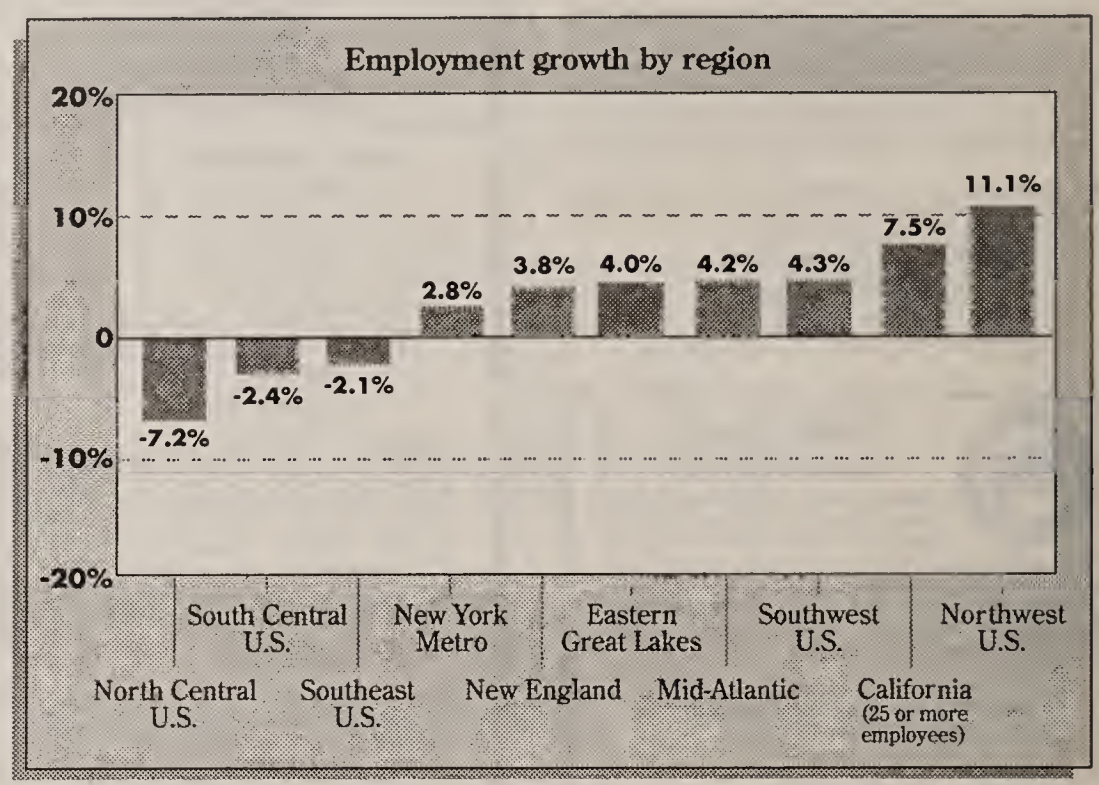



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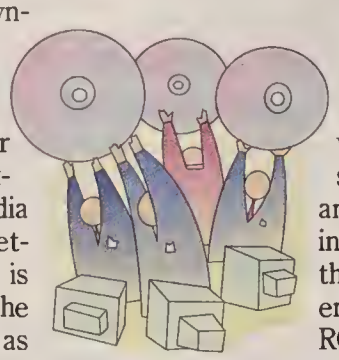
# CD-ROM drives: A divided picture

*Low-end drives are carrying smaller price tags but don't offer users full-performance capabilities*

BY WILLIAM BRANDEL
SPECIAL TO CW

Using compact disc/read-only memory (CD-ROM) technology for archival storage of company data and as a medium for business reference materials has become a lot more practical in the past few months as a result of a downward trend in pricing for some CD-ROM drives.



However, for those hoping to exploit the multimedia storage devices in settings where speed is more of an issue, the news isn't quite as good. This applies to those needing storage of frequently accessed data or for interactive applications such as training.

One reason for this divided picture is the fact that there are really two quite different categories of CD-ROM drives on the market today. As Bob Abraham, an analyst at Freeman Associates, Inc. in Santa Barbara, Calif., explains it, "The market is split between the full-performance-grade drives and the low-performance drives."

The high-performance drives — the ones more likely to be purchased for interactive imaging because of their superior data access and retrieval speeds and heavier duty construction — have dropped slightly in price. But that's not where the real news is.

The real activity is at the lower end in the personal computer market, where companies such as Tandy Corp. and NEC Corp. have introduced products that are inexpensive enough to make CD-ROM a viable alternative to expensive online access to archival services such as Dow Jones/News Retrieval.

### Costly inquiries

Depending on the amount of time that it takes for an individual to find the correct inquiry and download a report, these services can run up a bill of hundreds of dollars in less than an hour. Taking into consideration bills like that, many information systems managers are finding that it doesn't take too much traffic to justify buying a reference disc and a drive when you can pick up a Tandy CDR-1000 for less than $400 or a NEC CDR 36 for a $450 price tag.

In many cases, however, information systems managers don't even have to spring for ownership. With prices at the low end dropping as much as they are, some CD-ROM publishers have begun to offer rental agreements to purchasers of their discs.

Companies such as West Publishing in St. Paul, Minn., will sell users the software and then rent the drive to them for $55 to $85 a month with free service and support.

### Not for everyone

None of this really helps the IS manager who needs CD-ROM for heavy-use storage and retrieval or training situations. That kind of use requires a strong motor capable of quickly torquing up and down to search a disc from inside to outside for the requested information. Sometimes the CD-ROM drive will also require a heavier duty housing than the plastic typically used on low-end drives.

High-performance drives are typically metal-coated and, according to Barry Cinnamon, president of the Bureau of Electronic Publishing, Inc. in Parsippany, N.J., that extra measure of protection really makes a significant difference.

"In our testing, we've actually driven a truck over a Hitachi 1700," Cinnamon says. "It had a big dent and tire marks, but it still worked."

### Price just one factor

When it comes right down to it, however, drive prices aren't the only or even the biggest obstacle for most IS managers considering CD-ROM for interactive imaging applications.

"CD-ROM drives aren't going to affect our imaging plans," says Paul Kittle, network administrator at Lolaminda University Hospital in Lolaminda, Calif. "Just because a person can buy the drives for $400 to $500 doesn't help me."

On a network, Kittle explains, the real costs are in the box and network drivers that control access to the CD-ROM drive.

"When networking equipment for CD-ROMs comes down in price, then I'll be happy," Kittle says.

**Driving force**

*Projected installed base for CD-ROM drives will more than triple by 1995*

| | 1990 | 1991* | 1992* | 1993* | 1994* | 1995* |
|---|---|---|---|---|---|---|
| Drives installed per year | 404 | 596 | 790 | 970 | 1,130 | 1,245 |
| Installed base at year's end | 805 | 1,382 | 2,132 | 3,025 | 4,020 | 5,045 |

*Projected (units in thousands)

Source: Freeman Associates, Inc. CW Chart: Michael Siggins

Brandel is a free-lance writer based in Boston.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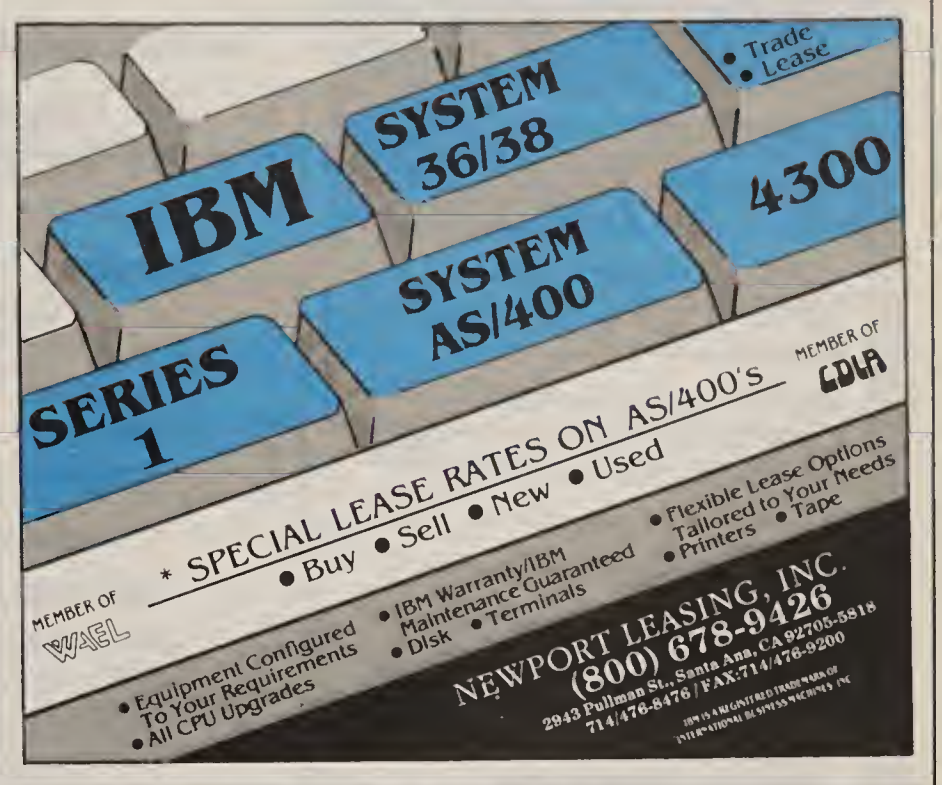


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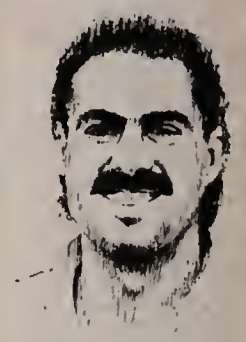

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Contact Person 1: Linda Kelly (617) 727-7500 x208: Mailing Address: Bureau of Information and Technology Acquisitions, One Ashburton Place, Room 1017, Boston, MA 02108.

Contact Person 2: Vincent Piccinni (617) 727-9006: Department of Revenue, 100 Cambridge St., Boston, MA 02204.

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# INDUSTRY ALMANAC

## ANALYSIS IN BRIEF

*Enterprisewide systems: European outlook*
*Bear, Stearns & Co., New York*
The UK seems to be pulling out of recession, following a recovery pattern similar to that of the U.S. While Germany expands, economies in other European countries continue to erode. France, Italy and Switzerland are all experiencing downturns.

A new investment opportunity is emerging in the form of technology firms that have been particularly hurt by the recent business contractions in the U.S. and the UK. Buying stock in those firms now is a good idea because computer sales in those areas will pick up during the next 12 months as the recessions abate. Especially good buys are **IBM, Pyramid Technology Corp., Sun Microsystems, Inc.** and **Stratus Computer, Inc.**

*Minicomputers: Earnings preview*
*Prudential Securities, Inc., New York*
**Digital Equipment Corp.** will have a difficult quarter, to be reported late this week. New VAXs expected to surface Oct. 30 should contribute to earnings improvements next quarter, however.

**Sequent Computer Systems, Inc.** has taken the initial steps in reviving business by scheduling restructuring charges early in the fiscal year to keep expenses down. Do not expect much upside in earnings for the quarter to be reported Oct. 21, but the company should break even or reach modest profitability in the fourth quarter of 1992.

Varied distribution channels and end-user target markets have helped Stratus get through some recent quarters. Expect the same for this one.

KIM S. NASH

### Peaks and valleys

| *Selected stocks trading at or near year highs* | 52-week high | Closing price 10/4 | Rating* |
|---|---|---|---|
| Informix Corp. | $9.00 | $9.00 | ● |
| On-Line Software International, Inc. | $15.75 | $15.75 | ● |
| Wellfleet Communications, Inc. | $32.25 | $32.00 | |
| Picturetel Corp. | $35.50 | $34.75 | |
| Microsoft Corp. | $90.00 | $88.13 | ● |
| Oracle Corp. | $14.13 | $13.75 | ● |
| Stratus Computer, Inc. | $40.75 | $39.13 | |
| Novell, Inc. | $39.63 | $37.25 | |
| Ross Systems, Inc. | $13.75 | $12.75 | ● |
| Cabletron Systems, Inc. | $52.88 | $48.63 | ● |
| BMC Software, Inc. | $55.00 | $50.25 | ● |
| Network General Corp. | $14.38 | $13.13 | |
| Easel Corp. | $31.00 | $28.00 | ● |

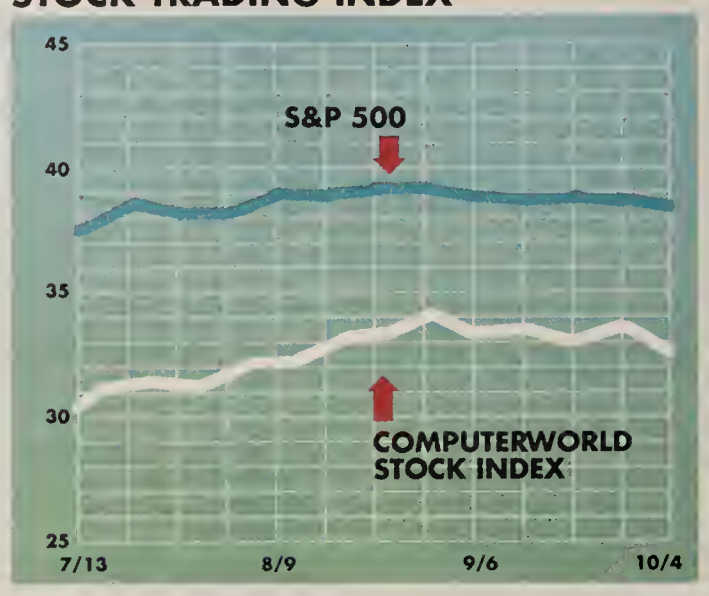
| *Stocks trading close to year lows* | 52-week low | Closing price 10/4 | Rating* |
|---|---|---|---|
| Synoptics Communications, Inc. | $19.75 | $19.75 | |
| IBM | $94.00 | $98.38 | |
| Compaq Computer Corp. | $29.88 | $31.38 | |
| Atmel Corp. | $9.63 | $10.38 | |
| Digital Systems International, Inc. | $8.50 | $9.25 | ● |
| Archive Corp. | $2.75 | $3.00 | |

*Donaldson, Lufkin & Jenrette Securities Corp. rating

Not rated ● Neutral ● Unattractive ● Moderately attractive ● Very attractive

CW Chart: Michael Siggins

## STOCK TRADING INDEX




## THIS WEEK'S HIGHLIGHTS

- Personal computer makers, in the midst of a drastic price-cutting trend, held their ground on Wall Street last week. Dell Computer Corp. rose ⅞ of a point to close Thursday at 32, AST Research, Inc. jumped 1⅛ to 29, and Advanced Logic Research, Inc. inched up ⅛ of a point to 11⅜. Compaq Computer Corp. rebounded from recent losses, closing at 33, up 1½ for the week.
- Zeos International, Inc. went the other way, dropping down 3½ points to 14¾ at Thursday's close. Other falling stocks were those of software vendors Adobe Systems, Inc., fading 2¾ to finish at 50, and Aldus Corp., sinking 5 points to 37.
- Investors remained unimpressed by Chips and Technologies, Inc.'s announcement of forthcoming clones of Intel Corp.'s 80386 processor. Chips and Technologies slumped ⅜ to 8⅜. Intel climbed 2½ points to 42.
- Platinum Technology, Inc., which recently issued a 2-for-1 stock split, moved up ¼ of a point to 17½.

# Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, OCTOBER 11, 1991

### TOP PERCENT GAINERS

| | |
|---|---|
| Rexon Inc. | 23.91 |
| Advanced Micro Devices | 16.67 |
| General Datacomm Inds. | 14.29 |
| Archive Corp. | 12.50 |
| Sequent Computer Sys. | 11.90 |

### TOP PERCENT LOSERS

| | |
|---|---|
| Selecterm Inc. | -23.53 |
| MIPS Computer Systems | -20.88 |
| IPL Systems Inc. | -19.44 |
| Bolt, Beranek & Newman | -10.20 |
| Silicon Graphics | -10.00 |

### TOP DOLLAR GAINERS

| | |
|---|---|
| Digital Equipment Corp. | 3.50 |
| General Motors E (EDS) | 3.00 |
| Novell Inc. | 2.88 |
| BMC Software Inc. | 2.75 |
| Motorola Inc. | 2.25 |

### TOP DOLLAR LOSERS

| | |
|---|---|
| IPL Systems Inc. | -4.38 |
| Policy Management Sys. | -4.38 |
| Silicon Graphics | -4.25 |
| Adobe Systems Inc. | -3.75 |
| Aldus Corp. | -3.13 |

| Exch | 52-Week | Range | | Oct. 11 Close | Wk Net Change | Wk Pct Change |
|---|---|---|---|---|---|---|
| **Communications and Network Services** | | | | | | **Up 1.39%** |
| OTC | 10.50 | 5.38 | 3 COM Corp. | 9.63 | 0.50 | 5.48 |
| NYS | 69.75 | 55.75 | American Info Techs Corp. | 61.00 | 1.50 | 2.52 |
| NYS | 40.38 | 29.00 | AT&T | 36.88 | 0.50 | 1.37 |
| OTC | 4.13 | 0.88 | Artel Communication Corp. | 1.63 | 0.13 | 8.33 |
| NYS | 56.25 | 43.00 | Bell Atlantic Corp. | 44.38 | 1.13 | 2.60 |
| NYS | 56.25 | 46.13 | Bellsouth Corp. | 48.13 | -0.63 | -1.28 |
| NYS | 52.88 | 17.50 | Cabletron Systems | 46.00 | -2.63 | -5.40 |
| OTC | 25.88 | 8.25 | Compression Labs Inc. | 21.50 | 1.50 | 7.50 |
| OTC | 5.13 | 2.00 | Data Switch Corp. | 2.25 | 0.19 | 9.06 |
| NYS | 21.50 | 9.00 | Digital Comm. Assoc. | 14.88 | -0.50 | -3.25 |
| OTC | 25.25 | 12.25 | Dynatech Corp. | 15.00 | 0.00 | 0.00 |
| OTC | 12.38 | 5.00 | Fibronix Int'l Inc. | 6.25 | 0.00 | 0.00 |
| OTC | 3.75 | 2.00 | Gandalf Technologies Inc. | 2.38 | -0.13 | -5.00 |
| NYS | 3.50 | 1.63 | General Datacomm Inds. | 3.00 | 0.38 | 14.29 |
| NYS | 33.50 | 26.63 | GTE Corp. | 31.25 | 0.63 | 2.04 |
| NYS | 63.00 | 40.25 | ITT Corp. | 54.88 | -0.63 | -1.13 |
| OTC | 32.50 | 17.88 | MCI Commmunications Corp. | 28.38 | 0.50 | 1.79 |
| OTC | 11.25 | 2.75 | Microcom Inc. | 11.25 | 0.25 | 2.27 |
| NYS | 13.75 | 4.00 | Network Equipment Tech. | 11.25 | -0.38 | -3.23 |
| OTC | 14.38 | 4.50 | Network General | 13.38 | 0.25 | 1.90 |
| OTC | 18.88 | 8.13 | Network Systems Corp. | 16.50 | -0.25 | -1.49 |
| NYS | 41.00 | 22.63 | Northern Telecom Ltd. | 39.50 | 0.13 | 0.32 |
| OTC | 40.13 | 9.25 | Novell Inc. | 40.13 | 2.88 | 7.72 |
| NYS | 77.63 | 67.00 | Nynex Corp. | 75.25 | -0.75 | -0.99 |
| NYS | 47.00 | 38.50 | Pacific Telesis Group | 42.13 | 1.13 | 2.74 |
| OTC | 11.63 | 3.63 | Penril Data Comm. Ntwks. | 8.25 | -0.25 | -2.94 |
| OTC | 36.25 | 8.25 | PictureTel Corp. | 36.25 | 1.50 | 4.32 |
| NYS | 17.88 | 8.88 | Scientific Atlanta Inc. | 13.13 | -0.50 | -3.67 |
| NYS | 57.75 | 49.00 | Southwestern Bell Corp. | 55.25 | 0.00 | 0.00 |
| NYS | 31.50 | 20.63 | United Telecom | 23.13 | -0.75 | -3.14 |
| NYS | 40.75 | 34.00 | US West Inc. | 35.13 | 0.13 | 0.36 |
| **Computer Systems** | | | | | | **Up 0.57%** |
| OTC | 20.75 | 4.50 | Advanced Logic Research | 12.13 | 0.38 | 3.19 |
| ASE | 17.88 | 10.38 | Amdahl Corp. | 13.75 | -0.13 | -0.90 |
| OTC | 73.25 | 24.25 | Apple Computer Inc. | 48.50 | 0.25 | 0.52 |
| OTC | 9.13 | 2.75 | Archive Corp. | 3.38 | 0.38 | 12.50 |
| OTC | 32.75 | 7.50 | AST Research Inc. | 28.75 | 0.00 | 0.00 |
| NYS | 9.38 | 4.00 | Bolt, Beranek & Newman | 5.50 | -0.63 | -10.20 |
| NYS | 21.63 | 5.75 | Commodore Int'l | 13.50 | 0.88 | 6.93 |
| NYS | 74.25 | 29.88 | Compaq Computer Corp. | 32.75 | 1.38 | 4.38 |
| OTC | 2.50 | 0.38 | Computer Automation Inc. | 1.50 | 0.13 | 9.09 |
| NYS | 13.75 | 6.75 | Control Data Corp. | 9.25 | -0.25 | -2.63 |
| NYS | 19.75 | 8.38 | Convex Computer | 11.00 | 0.63 | 6.02 |
| NYS | 44.50 | 22.63 | Cray Research Inc. | 40.38 | 1.63 | 4.19 |
| NYS | 22.38 | 3.50 | Data General Corp. | 20.25 | 1.63 | 8.72 |
| NYS | 4.38 | 1.00 | Datapoint Corp. | 3.75 | -0.25 | -6.25 |
| OTC | 36.25 | 8.38 | Dell Computer Corp. | 31.38 | 0.63 | 2.03 |
| NYS | 83.00 | 45.50 | Digital Equipment Corp. | 57.13 | 3.50 | 8.53 |
| NYS | 28.88 | 13.75 | Harris Corp. | 21.88 | -0.75 | -3.31 |
| NYS | 56.63 | 24.88 | Hewlett Packard Co. | 46.88 | 0.00 | 0.00 |
| NYS | 139.75 | 94.00 | IBM | 100.00 | 1.63 | 1.65 |
| OTC | 12.00 | 7.75 | Information Int'l | 9.75 | 1.00 | 11.43 |
| NYS | 149.00 | 106.00 | Matsushita Electronics | 118.50 | -1.75 | -1.46 |
| OTC | 20.88 | 7.25 | MIPS Computer Systems | 9.00 | -2.38 | -20.88 |
| NYS | 110.00 | 44.50 | NCR Corp. | 108.00 | 0.00 | 0.00 |
| OTC | 29.50 | 10.75 | Pyramid Technology | 15.25 | 0.50 | 3.39 |
| OTC | 20.25 | 7.50 | Sequent Computer Sys. | 11.75 | 1.25 | 11.90 |
| NYS | 47.25 | 18.00 | Silicon Graphics | 38.25 | -4.25 | -10.00 |
| NYS | 40.75 | 15.38 | Stratus Computer Inc. | 38.13 | -1.00 | -2.56 |
| OTC | 38.63 | 15.00 | Sun Microsystems Inc. | 26.38 | -1.50 | -5.38 |
| NYS | 17.63 | 8.88 | Tandem Computers Inc. | 12.88 | 0.75 | 6.19 |
| OTC | 4.75 | 1.25 | Tandon Corp. | 2.00 | -0.06 | -3.05 |
| NYS | 36.50 | 23.38 | Tandy Corp. | 28.50 | -0.13 | -0.44 |
| OTC | 24.50 | 6.75 | Teradata | 21.63 | 0.63 | 2.98 |
| NYS | 6.13 | 1.38 | Ultimate Corp. | 2.75 | -0.13 | -4.35 |
| NYS | 7.00 | 1.75 | Unisys Corp. | 4.13 | -0.25 | -5.71 |
| ASE | 5.75 | 2.00 | Wang Labs Inc. (b) | 2.75 | -0.25 | -8.33 |
| **Software & DP Services** | | | | | | **Off 0.78%** |
| OTC | 63.00 | 17.00 | Adobe Systems Inc. | 49.00 | -3.75 | -7.11 |
| OTC | 12.25 | 3.50 | Aicorp | 5.50 | 0.13 | 2.33 |
| OTC | 59.88 | 21.75 | Aldus Corp. | 37.75 | -3.13 | -7.65 |
| OTC | 28.50 | 13.63 | American Mgmt. Systems | 21.50 | -0.25 | -1.15 |
| OTC | 17.25 | 7.63 | American Software Inc. | 13.50 | -0.38 | -2.70 |
| NYS | 4.63 | 1.38 | Anacomp Inc. | 3.38 | 0.25 | 8.00 |
| OTC | 18.25 | 11.00 | Analysts Int'l | 15.00 | 0.75 | 5.28 |
| OTC | 16.63 | 5.13 | Ashton Tate | 16.38 | 0.63 | 3.97 |
| OTC | 13.00 | 4.38 | ASK Computer Sys. | 11.25 | -0.50 | -4.26 |
| NYS | 37.00 | 23.25 | Auto Data Processing | 36.00 | 1.00 | 2.86 |
| OTC | 62.25 | 33.00 | Autodesk Inc. | 47.38 | -0.63 | -1.30 |
| OTC | 35.50 | 18.50 | BGS Systems Inc. | 34.25 | 0.50 | 1.48 |
| OTC | 55.00 | 18.50 | BMC Software Inc. | 53.00 | 2.75 | 5.47 |
| OTC | 18.00 | 8.75 | Boole & Babbage Inc. | 10.00 | -0.25 | -2.44 |
| OTC | 64.25 | 18.63 | Borland Int'l | 47.63 | -2.38 | -4.75 |
| OTC | 20.88 | 5.38 | Cognos Inc. | 15.88 | -0.88 | -5.22 |
| NYS | 11.13 | 5.38 | Computer Associates | 7.50 | -0.25 | -3.23 |
| OTC | 17.75 | 9.50 | Computer Horizons | 10.00 | -0.50 | -4.78 |
| NYS | 73.25 | 38.25 | Computer Sciences | 64.00 | -0.75 | -1.16 |
| NYS | 11.25 | 6.63 | Computer Task Group | 8.00 | 0.13 | 1.59 |
| OTC | 22.75 | 13.00 | Comshare Inc. | 17.50 | -1.25 | -6.87 |
| OTC | 13.25 | 3.75 | Corporate Software | 9.38 | -0.13 | -1.32 |
| NYS | 52.25 | 31.25 | General Motors E (EDS) | 50.75 | 3.00 | 6.28 |
| OTC | 18.75 | 7.25 | Goal Systems Int'l | 12.75 | 0.00 | 0.00 |
| OTC | 7.00 | 1.88 | Hogan Systems Inc. | 5.50 | -0.13 | -2.22 |
| OTC | 29.25 | 7.75 | Information Resources | 25.50 | -1.75 | -6.42 |
| OTC | 9.63 | 2.63 | Informix Corp. | 9.25 | 0.25 | 2.78 |
| OTC | 3.63 | 1.38 | Intellicorp Inc. | 1.63 | -0.13 | -7.14 |
| OTC | 31.50 | 10.50 | Intergraph | 19.00 | 0.13 | 0.68 |
| OTC | 8.25 | 3.00 | Interleaf Inc. | 7.38 | 0.13 | 1.72 |
| OTC | 12.25 | 6.88 | Intersolv | 11.25 | 0.50 | 4.65 |
| OTC | 43.25 | 10.00 | Knowledgeware Inc. | 12.00 | -0.13 | -1.03 |
| OTC | 45.00 | 16.75 | Legent Corp. | 32.00 | -0.50 | -1.54 |
| OTC | 40.75 | 12.50 | Lotus Development | 28.25 | 1.25 | 4.63 |
| OTC | 19.00 | 9.25 | Mentor Graphics | 13.25 | -0.25 | -1.85 |
| OTC | 32.00 | 9.75 | Micrografx | 15.75 | 1.00 | 6.78 |
| OTC | 90.50 | 35.75 | Microsoft Corp. | 89.63 | 1.50 | 1.70 |
| NYS | 15.75 | 4.00 | On Line Software Int'l | 15.75 | 0.00 | 0.00 |
| OTC | 15.13 | 4.88 | Oracle Systems | 14.00 | 0.25 | 1.82 |
| NYS | 16.00 | 7.00 | Pansophic Systems | 15.63 | 0.00 | 0.00 |
| OTC | 10.00 | 1.25 | Phoenix Technologies | 7.38 | -0.13 | -1.67 |
| OTC | 19.75 | 9.00 | Platinum Technology | 17.50 | -1.00 | -5.41 |
| NYS | 57.50 | 33.38 | Policy Management Sys. | 51.75 | -4.38 | -7.80 |
| NYS | 25.75 | 11.50 | Reynolds & Reynolds | 25.25 | -0.13 | -0.49 |
| OTC | 13.75 | 6.75 | Ross Systems | 12.00 | -0.75 | -5.88 |
| OTC | 27.50 | 15.25 | SEI Corp. | 26.50 | -0.75 | -2.75 |
| OTC | 23.38 | 13.88 | Shared Medical Systems | 20.88 | -0.88 | -4.02 |
| OTC | 35.25 | 12.00 | Software Publishing Corp. | 19.50 | 1.00 | 5.41 |
| NYS | 16.75 | 6.38 | Sterling Software | 15.75 | 0.25 | 1.61 |
| OTC | 18.25 | 9.50 | Sungard Data Sys. | 14.00 | -0.75 | -5.08 |
| OTC | 68.50 | 17.75 | Symantec Corp. | 63.25 | 0.75 | 1.20 |
| NYS | 10.63 | 4.50 | System Center Inc. | 9.50 | 0.13 | 1.33 |
| OTC | 37.25 | 12.50 | System Software Assoc. | 20.75 | -1.25 | -5.68 |
| **Semiconductors** | | | | | | **Up 5.14%** |
| NYS | 14.25 | 3.75 | Advanced Micro Devices | 10.50 | 1.50 | 16.67 |
| NYS | 12.50 | 5.50 | Analog Devices Inc. | 7.25 | 0.13 | 1.75 |
| OTC | 13.50 | 5.25 | Chips & Technologies | 8.13 | -0.25 | -2.99 |
| OTC | 59.25 | 30.25 | Intel Corp. | 41.88 | 1.88 | 4.69 |
| NYS | 12.50 | 5.25 | LSI Logic Corp. | 7.75 | 0.75 | 10.71 |
| NYS | 19.13 | 6.75 | Micron Technology | 15.38 | 0.75 | 5.13 |
| NYS | 71.25 | 45.75 | Motorola Inc. | 59.00 | 2.25 | 3.96 |
| NYS | 8.38 | 3.00 | National Semiconductor | 4.50 | 0.25 | 5.88 |
| NYS | 47.63 | 22.50 | Texas Instruments | 29.88 | 1.63 | 5.75 |
| OTC | 12.25 | 3.00 | VLSI Technology | 6.88 | 0.25 | 3.77 |
| OTC | 16.75 | 4.75 | Weitek | 6.00 | -0.13 | -2.04 |
| ASE | 6.75 | 2.50 | Western Digital Corp. | 3.25 | 0.25 | 8.33 |
| **Peripherals & Subsystems** | | | | | | **Up 0.68%** |
| OTC | 2.75 | 0.88 | Apertus Technologies | 1.38 | -0.06 | -4.38 |
| OTC | 15.75 | 7.50 | Banctec Inc. | 15.75 | 1.25 | 8.62 |
| OTC | 21.75 | 4.25 | Cambex Corp. | 18.00 | -1.25 | -6.49 |
| ASE | 11.75 | 4.75 | Cognitronics Corp. | 7.75 | -0.13 | -1.59 |
| NYS | 31.25 | 15.38 | Conner Peripherals | 18.63 | 0.00 | 0.00 |
| ASE | 16.38 | 7.00 | Dataram Corp. | 15.63 | 0.13 | 0.81 |
| NYS | 13.00 | 4.88 | EMC Corp. | 7.38 | 0.13 | 1.72 |
| NYS | 47.25 | 36.63 | Eastman Kodak Co. | 42.88 | 0.75 | 1.78 |
| OTC | 11.25 | 4.75 | Emulex Corp. | 6.00 | 0.38 | 6.67 |
| OTC | 24.00 | 14.00 | Evans & Sutherland | 16.75 | -0.13 | -0.74 |
| OTC | 7.50 | 3.88 | Iomega Corp. | 7.25 | -0.19 | -2.53 |
| OTC | 28.25 | 8.00 | IPL Systems Inc. | 18.13 | -4.38 | -19.44 |
| OTC | 6.25 | 1.63 | Maxtor Corp. | 4.88 | 0.31 | 6.84 |
| OTC | 18.00 | 5.00 | Micropolis Corp. | 6.25 | 0.25 | 4.17 |
| NYS | 97.50 | 74.25 | 3M Corp | 90.75 | 1.50 | 1.68 |
| OTC | 10.75 | 5.75 | Printronix Inc. | 6.25 | 0.00 | 0.00 |
| NYS | 24.88 | 9.25 | QMS Inc. | 24.88 | 1.25 | 5.29 |
| OTC | 18.25 | 8.38 | Quantum Corp. | 10.13 | -0.38 | -3.57 |
| NYS | 7.63 | 4.38 | Recognition Equipment | 6.88 | 0.25 | 3.77 |
| OTC | 11.50 | 4.00 | Rexon Inc. | 7.13 | 1.38 | 23.91 |
| OTC | 19.88 | 5.63 | Seagate Technology | 7.75 | 0.13 | 1.64 |
| NYS | 51.50 | 12.25 | Storage Technology | 42.13 | 0.63 | 1.51 |
| NYS | 30.88 | 13.88 | Tektronix Inc. | 22.50 | -1.38 | -5.78 |
| OTC | 0.53 | 0.16 | Televideo Systems | 0.25 | 0.00 | 0.00 |
| NYS | 62.13 | 29.00 | Xerox Corp. | 59.25 | -1.88 | -3.07 |
| **Leasing Companies** | | | | | | **Off 6.16%** |
| OTC | 18.25 | 7.00 | Amplicon Inc. | 15.25 | 0.00 | 0.00 |
| NYS | 28.38 | 14.75 | Comdisco Inc. | 20.38 | 0.13 | 0.82 |
| OTC | 15.75 | 8.88 | LDI Corporation | 14.25 | -0.25 | -1.72 |
| OTC | 4.50 | 2.25 | Selecterm Inc. | 3.25 | -1.00 | -23.53 |

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# System/36 package vexes IBM

BY MARYFRAN JOHNSON
CW STAFF

NEWPORT BEACH, Calif. — Controversy swirled last week around a new software package that offers IBM midrange users a virtually painless migration path from their old System/36s to the Unix-based RISC System/6000.

The Open RS/36 application, sold by Open Universal Software, Inc., based here, is now in beta testing at sites such as Eastman Kodak Co. and the U.S. Department of Agriculture.

Yet sales were abruptly halted last week in IBM distributor channels by a warning from IBM's legal department. That warning filtered down to local sales offices via IBM's internal electronic mail network and made vague reference to intellectual property rights and possible copyright infringement. The salespeople then began cautioning IBM distributors not to sell Open RS/36.

Open RS/36 creates a System/36 "workalike" shell on the RS/6000's AIX operating system and enables users to move binary code over from the older machine to the Unix box without recompiling.

"I'm just asking my customers to wait," said Douglas Pelletier, vice president at Trifecta Consulting Group in Allentown, Pa. "We don't want to get ourselves in hot water with IBM."

Robert LaBant, an IBM vice president and general manager, said the issue has been overblown. He said IBM's legal department routinely examines the products of potential business partners.

"Distributors and salespeople should never have been involved in this," LaBant said. "Anytime there is someone trying to emulate our operating systems, we — as any vendor would — end up taking a look at it."

"It is an extremely unfortunate accident that this internal IBM document got forwarded to the field-level people," said John Szwaronek, Open Universal Software president. "It has nearly destroyed our dealer net."

### A likely lure

Industry consultants and beta-test site users who have worked with Open RS/36 said the product is likely to lure more converts from the System/36 to the RS/6000. That strikes yet another blow to IBM's efforts to move more of an estimated 200,000 System/36 users to the Application System/400 line.

"Everyone's nerves are on edge," said Al Saavedra, vice president of marketing at Open Universal Software.

Analysts said the product, priced at $400 per user, should appeal to a niche of System/36 customers: companies or divisions that have outgrown the machine yet have all their applications written in RPG code.

"It works, and it meets my needs," said Richard Glave, a lead systems analyst at Kodak in Rochester, N.Y. "I can take my [RPG-based] library from the System/36, load it on the RS/6000, and it runs."

Analysts and distributors said Open RS/36 has run into IBM's own internal battle between the RS/6000 and the AS/400.

LaBant, however, vehemently denied that. "There is no debate or conflict or anything like that between us and the [RS/6000] people," the chief executive for the AS/400 line said.

Still, many industry observers insist there is a competitive clash between IBM's two most successful product lines.

"I don't think the perceived competition between those two branches is healthy for their image," said Bob Tipton, president of R S Tipton, Inc., an IBM midrange consulting firm in Denver.

Open RS/36's ability to duplicate the System/36 operating environment on the RS/6000 may have also aroused IBM suspicion of copyright infringement, analysts said.

"We have taken nothing from the IBM operating system," Szwaronek said.

# IBM Information Network hooks up to X.25 services

BY ELISABETH HORWITT
CW STAFF

WHITE PLAINS, N.Y. — After years of being the only major value-added network service without X.25 support, IBM Information Network is finally providing that capability — sort of.

The network service announced last week that it will interconnect any device that conforms to the CCITT X.25 packet-switched protocol. Previously, IBM had only provided a translation service that allowed 3270 devices to access X.25-based services, such as a database service, IBM spokesman Stan McCluskey said.

The U.S. X.25 value-added network (VAN) market, led by U.S. Sprint Communications Co. and BT Tymnet, Inc., is expected to grow from $932 million in 1991 to $3.2 billion in 1996, according to a report by Livingston, N.J., research firm Insight Research Corp. IBM had 3.5% of the U.S. VAN market in 1990, according to Vertical Systems Group, Inc., a Dedham, Mass., research firm.

IBM's entry into the X.25 world is overdue and crucial for its U.S. and overseas customers, said Rosemary Cochran, a principal at Vertical Systems Group. IBM Information Network serves IBM shops that communicate almost entirely in the Systems Network Architecture (SNA) world. However, such shops increasingly want to link up with business partners and customers whose systems may not support SNA, she said.

One such company is Blue Cross/Blue Shield. The medical service firm recently completed the first phase of a corporatewide network that uses Timeplex, Inc. T1 switches for internal communications and IBM Information Network to connect with providers and customers, according to senior consultant Robert Schultz. X.25 support for Information Network "would certainly be valuable as a way to access other outside companies, especially down the road; the more flexibility we have to communicate, the better," Schultz said.

The fact that X.25 packets will run over IBM Information Network's SNA backbone will result in some degradation for interactive applications that use character echo mode, such as Telnet applications that run on Transmission Control Protocol/Internet Protocol, McCluskey said.

### Overseas objective

IBM is also thinking about enhancing the quality and cost-effectiveness of its Information Network offerings overseas by using overseas carriers' circuits to supplement parts of its network in Europe, according to IBM spokesman Robert Stafford. IBM is talking about such an arrangement with British Telecommunciations PLC's Syncordia subsidiary, as well as with European Postal Telephone and Telegraph authorities, he added.

IBM denied last week that it intended to outsource its overseas network to Syncordia or that IBM and BT Tymnet plan to act as joint network outsourcers. However, the two companies are talking about "teaming up on large contracts" that might involve their respective products and services, Stafford said.

IBM plans to begin rolling out X.25 support for its network in mid-1992, McCluskey said. Pricing is still not determined.

# NEWS SHORTS

## Legent buys Spectrum Concepts

Legent Corp. last week announced its intent to acquire Spectrum Concepts, Inc., a New York software firm. Spectrum develops file-transfer and software-distribution packages that Legent will integrate with some of its existing products. For example, Legent's Endeavor systems management software will be able to remotely distribute software and upgrades to end users. Spectrum Concepts had 1990 revenue of about $20 million. The deal is expected to be completed by year's end.

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## Apple to adopt Soviet technology

Apple Computer, Inc. has signed an agreement to use handwriting-recognition technology developed by a USSR/U.S. joint venture. The accord — considered to be the first transfer of commercially significant technology from the Soviet Union to a major U.S. computer maker — gives Apple access to Paragraph International's handwritten text-recognition technology. Paragraph is a Boulder, Colo., firm that markets products developed by Paragraph JV, a USSR/U.S. joint venture.

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## Geoworks folds in Quattro Pro

Berkeley, Calif.-based Geoworks announced last week that it has integrated Borland International, Inc.'s Quattro Pro SE spreadsheet into Geoworks Pro, its graphical environment and applications package. The entire package — including the Quattro Pro spreadsheet, a word processor, object-oriented drawing tools, communications applications and file and personal information manager — will sell for $199.99.

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## Genix inks $25M outsourcing deal

The Genix Group, a subsidiary of MCN Corp., won a five-year, $25 million outsourcing contract from Computer Technology Management, a Toledo, Ohio-based information services firm. Genix will supply data processing services to Computer Technology Management customer Libbey-Owens-Ford. Genix will be responsible for supplying mainframes, operating systems software, network management, storage and operational resources.

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## Desktop Unix V.4 plans revealed

After almost a year of hinting, Unix System Laboratories, Inc. is expected to let the cat out of the bag next week regarding its desktop version of Unix. The miniature version of System V Release 4 — which industry observers have dubbed "Unix Lite" but which the company is now calling Unix Desktop — will require approximately 6M bytes of memory and 60M bytes of disk space, a company spokesman confirmed. The system will include an as-yet-undetermined user interface. It is scheduled to ship in 1992 and will be targeted at machines based on Intel Corp.'s 80386 and I486 chips.

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## Operation Sundevil scope emerges

The Computer Professionals for Social Responsibility (CPSR), an advocacy group, received more than 2,400 documents from the U.S. Secret Service under the Freedom of Information Act last week. The documents relate to Operation Sundevil, last year's nationwide dragnet through the hacker underground. An early look at the documents reveals that the scope of the operation was considerably broader than the U.S. Secret Service has admitted, said Mark Rotenberg, director of CPSR's Washington, D.C., office. CPSR will soon hold a press conference to discuss the findings, he added.

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## X.500 group drafts bill of rights

The North American Directory Forum, a group of electronic mail vendors trying to create a public E-mail directory under the CCITT X.500 standard, is planning to address the related privacy and security issues. The forum is drafting a user "bill of rights" in preparation for the "experimental directory pilot" that is scheduled for early 1992, according to a statement released by General Electric Information Services, a division of General Electric Co. in Rockville, Md.

# Comdex

FROM PAGE 1

activity, particularly the showing of the IBM machine, marks an important milestone for the embryonic market.

Analysts said the pen-based arena should grow quickly in the next few years as it draws in the tens of millions of mobile professionals who currently don't use a computer but could benefit from one: stock clerks, insurance adjusters, field sales professionals, health services workers and construction workers, for example.

Market research firm Computer Intelligence/Infocorp estimated that annual sales of pen-based computers will hit 3.4 million units by 1995 from 51,000 in 1991.

"After so many months of talk, there are finally products we can get our hands on, and that's exciting," said Bill Lempesis, publisher of the Pleasanton, Calif.-based *Penvision News*. "Now, the vendors just have to convince users that they can't live without a pen machine."

Before many users are willing to commit to pen-based systems, however, more work needs to be done, especially on compatibility issues.

"We have every type of computing platform out there, so connectivity to other environments is very important," said Karen Atkouf, director of advanced technology at American Express Co., which is considering arming hundreds of stock traders with pen systems.

IBM's offering will be based

**Samsung's Penmaster** *will be based on the 80386SL chip and offers a backlit VGA screen*

on Intel Corp.'s 20-MHz 80386SL microprocessor and will run Penpoint. Sources said it is expected to offer a reflective screen with a backlit option

forthcoming, weigh approximately five pounds and be available next year. Batteries should provide approximately four to eight hours of operation, depending on configuration. IBM may also show a tablet personal computer that runs OS/2 and recognizes pen input, sources said.

Other new Penpoint-based machines will also be demonstrated by NCR Corp., Grid Systems Corp., Hyundai Computer Corp. and Samsung Information Systems America, Inc.

Samsung's Penmaster will be based on the 80386SL chip and offer a backlit IBM Video Graphics Array screen. It can support up to 20M bytes of random-access memory, has a 120M-byte hard disk, weighs less than five pounds and is expected to sell for less than $5,000, according to sources.

The announcements represent an important early victory for Go, a tiny Foster City, Calif., start-up that has pitted itself against Microsoft in the battle for a pen-based standard. Penpoint is specifically designed for pen systems but is incompatible with DOS. Microsoft officials claimed their Windows for Pen Computing platform will offer full DOS compatibility.

Go Vice President Michael Homer said hardware manufacturers can install drivers that allow Penpoint to read DOS and OS/2 files.

Penpoint, which was officially announced this past January, is still in beta testing and is expected to be generally available by the first quarter of next year.

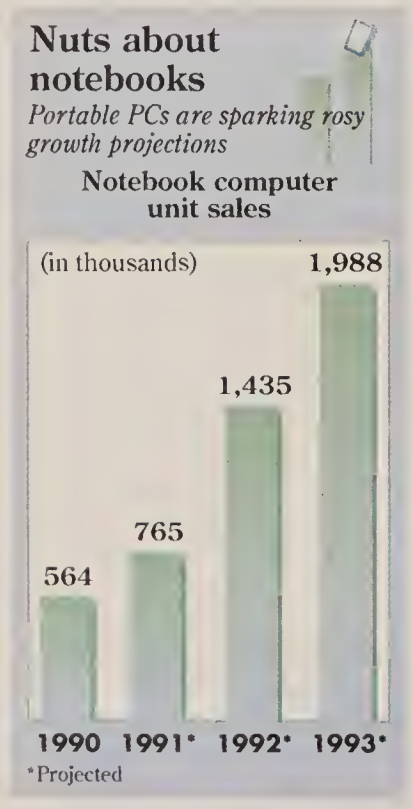
# Portable makers squeeze 486 into notebook size

BY MICHAEL FITZGERALD
CW STAFF

High-powered portables have meant weary arms for users to date, but a new lightweight era is coming.

Toshiba America Information Systems, Inc.'s T4400SX notebook is based on Intel Corp.'s new, lower powered version of the 25-MHz I486SX chip, but it weighs only 7½ pounds, and Toshiba claims it will run for three hours on nickel-cadmium batteries. Advanced Logic Research, Inc. (ALR) last week announced two seven-pound notebooks with 486 chips. Both companies' notebooks are upgradable.

Most vendors have not offered the 486 chip in a battery-powered portable, and those that have — notably, Groupe Bull subsidiary Zenith Data Systems — have put it in a heavy package (Zenith Data's Supersport 486 weighs 15 pounds).




Source: Workgroup Technologies, Inc.

### Seeing the future

Analysts said the Toshiba and ALR notebooks offer a look at the future of portable computing, which may see users shun desktops for small, high-powered notebooks. Observers cited similar products from Dell Computer Corp. and Acer America Corp. as well as the NB3300, a 33-MHz, 80386-based, nine-pound notebook from Micro Express in Santa Ana, Calif.

"It's setting us up for the desktop of the future and solidifying notebooks as the most popular footprint," said Tim Bajarin, executive vice president at Creative Strategies International, Inc. in Santa Clara, Calif.

The T4400SX, which is scheduled to ship in December, is announced one week after Compaq Computer Corp.'s 17.6-pound Portable 486C [CW, Oct. 7], which harks back to the traditional trade-offs of high-powered portable computing and heavy products that work only when they are plugged in.

**Toshiba's T4400SX** *notebook weighs only 7½ pounds and will run for up to three hours*

The Portable 486C offers an excellent color display and advanced security features, where the T4400SX has two monochrome display types: a gas-plasma display and a supertwist LCD.

Analysts did not predict strong sales for 486-based notebooks, though.

Bruce Stephen, director of personal computer hardware research at Framingham, Mass.-based International Data Corp., predicted that fewer than 60,000 notebooks with a 486-type chip will be sold in 1992.

There are some potential customers. One is Kraft General Foods, Inc. in Glenview, Ill., a division of Philip Morris Cos.

"I don't think it's overkill — our interest right now is in machines of 386 or greater class," said Wayne Munn, a business consultant at Kraft. Munn said Kraft wants notebooks that can handle memory management and graphical environments such as Microsoft Corp.'s Windows.

John Dunkle, a vice president at Workgroup Technologies, Inc. in Hampton, N.H., agreed that 486-based notebooks will not be hot sellers in 1992 but said Toshiba was smart to bring the product out.

"They're maybe a little ahead of themselves, which is extremely good news for Toshiba," Dunkle said. "The majority of their existing product line is antiquated and outdated. They need to pick up point products they can begin to rally around, and this is such a product."

Toshiba is also slated to announce today the T3300SL, which is based on Intel's 25-MHz 80386SL chip. Expresswriter 201, a 1.9-pound, $499 portable printer, is slated to ship later in the fourth quarter.

# Color hits laptop PCs

BY MICHAEL FITZGERALD
CW STAFF

AST Research, Inc. and Sharp Corp. will join Epson America, Inc. in the color notebook market at Comdex/Fall '91.

AST said it will announce the Premium Exec 386SXL/25C, based on Advanced Micro Devices, Inc.'s AM386SXL chip. The 7½-pound, $5,599 notebook will have a passive-matrix color screen. Analysts said problems with the display quality of the screen could hurt AST's ability to sell the product, despite a claimed two- to three-hour battery life.

"People looking at passive-matrix screens . . . weren't impressed in the quality of the color in the passive screen and felt they were not worth the investment," said Stephen Rood, a principal at Rood & Associates, Inc. in Ossining, N.Y.

Sharp confirmed reports that it will show two notebooks at Comdex, one of which will have an active-matrix color screen. Sources said the notebooks will be based on Intel Corp.'s 20-MHz 80386SL, with a 2½-hour battery life for the color version and a four- to five-hour battery life for the monochrome version.

Pricing was not available, but a Sharp spokesman said the monochrome version will ship in January 1992 and the active-matrix version soon thereafter.

Sharp makes the active-matrix screen in Epson's NB-SL/25C [CW, Sept. 30] but will offer a thinner product.

"Congratulations to Sharp for building an innovative product that can't be distributed because Sharp can't distribute," commented John Dunkle, vice president of Workgroup Technologies, Inc. in Hampton, N.H.

# Compaq, AST to fill holes in server lines

BY MICHAEL FITZGERALD
CW STAFF

DALLAS — Compaq Computer Corp. and AST Research, Inc. will both fill gaps in their file server lines here at Networld this week.

Compaq is due to introduce its upgradable Systempro LT line of lower priced, single-processor members of the Systempro family. Prices range from $5,999 for an Intel Corp. 25-MHz 80386-based server with a 120M-byte hard drive to $10,999 for a 33-MHz I486 tower with a 510M-byte hard drive. Previously, the lowest priced Systempro sold for $11,999.

"With that kind of pricing, we will be buying them for our smaller LANs," said Glenn Sandusky, chief information officer at Chicago-based Miller Mason Dickinson, a benefits consulting firm owned by Aon Corp.

AST plans to announce what it calls a step toward a more complete server product. Showing at Networld and again at Comdex/Fall '91 will be the Premium SE 4/33 systems, upgradable uniprocessor servers based on Intel's 33-MHz 486 chip. They will be available in configurations ranging from no hard drive to 1G-byte hard drives. At Comdex, AST will show the Premium SE 4/50 line, similar servers based on the 50-MHz 486.

The SE 4/33 models will ship in December and will sell for $9,495 to $14,795. The SE 4/50 will ship in the first quarter of next year. Pricing was not available.

Also on display and due in the first quarter of 1992 is AST's first disk array, which will manage between 6G bytes and 12G bytes of storage.

All Compaq and AST products are based on the Extended Industry Standard Architecture.

# Group offers vision for multimedia PCs

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — There was hyperbole but also reality at the MPC consortium's multimedia event here last week, as Microsoft Corp., Tandy Corp. and dozens of other vendors offered glimpses of what the group hopes will be the "mainstream" personal computer of the future.

MPC, which stands for Multimedia Personal Computer, is a consortium of vendors, including Microsoft, Tandy, Zenith Data Systems and NCR Corp., among others, that has worked to establish basic hardware and software standards for multimedia computing.

The "titles" (as multimedia applications are called) on display generally featured the ability to combine pictures, text and sound. Several featured animated video.

One example of the software on display was Interoptica Publishing Ltd.'s Great Cities of the World, which features a guided tour of 10 cities. For instance, someone headed to Moscow would be able to tap into maps of the city, learn basic facts about its history, see pictures of significant areas and hear common phrases that a traveler might need.

American Airlines and Sandoz Pharmaceuticals Corp. were showcased as corporations using custom-developed applications. American's maintenance facility in Tulsa, Okla., has put its repair manuals into a multimedia application. Sandoz is using multimedia to help educate medical students.

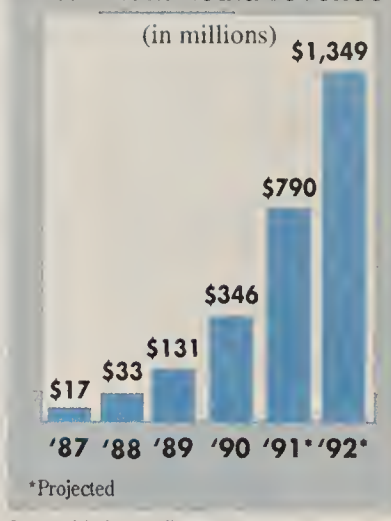
IBM, which is planning a major multimedia announcement for Thursday, including its own hardware platform for PC-based multimedia computing (see story at left), was not present, but those who were there said IBM's absence does not mean a rift in any potential standard for multimedia.

Microsoft Chairman Bill Gates told reporters that "IBM is fully supportive of what we are doing." However, IBM's Peter Blakeney, manager of multimedia market programs and education, kept the MPC consortium at arm's length largely because IBM disavows the basic MPC standard hardware platform, an Intel Corp. 80286-based machine with 2M bytes of random-access memory. Blakeney confirmed that IBM and Microsoft cooperate in various areas on multimedia development.

**Seeing is believing**

*The multimedia market has grown by more than 100% per year during the last four years*

**U.S. multimedia revenue**




Source: Market Intelligence Research Corp.

## Actionmedia preview

One of this week's two expected multimedia announcements by IBM was previewed last week in Japan, where IBM and Intel Corp. announced Actionmedia II, a video adapter they both developed.

Actionmedia II is slated to be unveiled in the U.S. Thursday as part of a major IBM announcement on multimedia.

The board works twice as fast as Intel's existing Digital Video Interactive technology and will cost significantly less. Along with the product was the Actionmedia II Audio Video Kernel, which will be supported by a set of device drivers and multimedia programming libraries.

IBM is also expected to introduce in a separate announcement tomorrow a new compact disc/read-only memory and laser disc products as part of its multimedia thrust.

Sources at IBM said Thursday's announcement will include products for other platforms besides the Personal System/2 line [CW, Sept. 30]. Among the offerings will be a multimedia version of IBM's PS/2 Model 57SX.

MICHAEL FITZGERALD

# Unix System Labs signs on with ACE

BY JOHANNA AMBROSIO
and J. A. SAVAGE
CW STAFF

MOUNTAIN VIEW, Calif. — Unix System Laboratories, Inc. (USL) last week joined the Advanced Computing Environment (ACE) initiative, a move that could quell some of the discord between Unix factions and add to the open systems movement's growing applications portfolio.

One benefit of USL's admission to ACE, the deal makers said, would be a merging of Unix System V Release 4 — the most installed strain of Unix in the marketplace — into ACE's operating system. USL will continue to sell and market Unix System V Release 4 separately from the alliance, said Roel Pieper, executive vice president of sales and marketing at Summit, N.J.-based USL.

With the addition of System V Release 4 into the mix, the Unix portion of the ACE operating system — due out next year — will be able to run applications written for Digital Equipment Corp.'s Ultrix, the Open Software Foundation's OSF/1 and System V Release 4, backers said.

"They seem to have come up with the best of both worlds," said Peter Kastner, vice president at Aberdeen Group, a consultancy in Boston, Mass. "Over the long run, it will be most beneficial to buyers because it will standardize the features and functions of an open systems environment."

### Some are skeptical

Not everyone, however, greeted the deal warmly. Some observers said vendors will still "tweak" the systems to differentiate them.

The combined operating system, to be sold by The Santa Cruz Operation (SCO), will run on both ACE platforms as well as a reduced instruction set computing-based system being provided by Mips Computer Systems, Inc. and Intel Corp.-based systems. Although the ACE environment is initially targeted for desktop consumption, the software is expected to increasingly find its way onto larger computers, observers said.

Essentially, USL and the original ACE backers, which include DEC, Compaq Computer Corp., Mips, Microsoft Corp. and the SCO, agreed to implement a common set of protocols and standards that now incorporates System V Release 4. Next week, Pieper said, USL plans to introduce its so-called Unix Lite, a System V Release 4 version that requires less memory and overhead than does the existing version. The Lite version will be incorporated into the ACE system.

In the future, ACE and USL executives promised, users and software vendors will need to write to only one set of specifications to allow software to run across virtually all of the ACE environments. Applications may have to be recompiled between platforms, however, and Microsoft's piece of the ACE operating environment, its New Technology system, remains separate from the Unix-based piece.

Users welcomed the deal but said they would wait for the finished products before getting too excited. "It sounds like good news," said Charles Gardner, director of information technology infrastructure at Eastman Kodak Co.'s Imaging Group in Rochester, N.Y. "The applications are a key part of it."

# IBM seeks allies to replace moribund PC software unit

BY PATRICIA KEEFE
CW STAFF

IBM's Desktop Software (IDS) group is as good as dead, leaving the vendor to look to alliances with major software vendors to fill the void.

Topping the list of software developers that could take over the rights to existing IBM products are Lotus Development Corp. and Micrografx, Inc., both strong OS/2 supporters and existing IBM partners.

IBM has not officially announced the demise of its desktop software experiment, but an IBM source said an announcement may be forthcoming as early as this week.

Sources close to the company have already begun to "wake" the independent business unit, unanimously describing its passing as an "embarrassment" for IBM. The unit was widely seen as IBM's last shot at making a name for itself as an applications developer [CW, June 24].

Instead, a source close to IDS said, the unit "never had a clear understanding of what the true dynamics of running an application software organization are."

The primary reasons for shutting down the unit were IBM's strong focus on OS/2 and its unwillingness to continue footing the bill for a division that was admittedly marginally profitable and oriented toward Microsoft Corp. Windows.

IBM released a statement last week saying it has "decided to move from a model where IDS is the primary developer and marketer for stand-alone PC applications . . . to a model based on alliances with major software vendors."

IDS markets six packages, four of which are licensed from tiny developers. IBM initially marketed the suite of applications as a single entity but could find no buyers, sources said. Hollywood, a presentation graphics program, reportedly has elicited the most interest, including some from Borland International, Inc. Lotus has been suggested as a buyer for Current, a personal information manager.

In its statement, IBM confirmed that the new alliances would be formed by transferring its rights to IDS packages to other IBM units or "leading independent software vendors" or by returning the rights to the original developer.

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# Women in computing

*The computing profession remains male-dominant*

**Computer systems analysts and scientists**

| | |
|---|---|
| Total | **605,000** |
| Women | **34.5%** |
| Men | **65.5%** |

**Operations and systems researchers and analysts**

| | |
|---|---|
| Total | **212,000** |
| Women | **41.5%** |
| Men | **58.5%** |

## FROM OUR READER FILE:

A Canadian PC user was driving a vendor's support desk crazy. No matter how many times the user typed what the support person advised, the machine was not responding in the appropriate way. It took awhile for the support person to figure out that the user was hearing, "Press control, eh?" instead of "Press (Ctrl) A" — *John Orr, Midas International, Chicago*

Kenneth Snelson

Chain Bridge Bodies is one of the computer-generated illustrations included "Computer Art and Design: The 1991 Siggraph Traveling Exhibition" opening Oct. 25 at the Computer Museum in Boston. The piece was created by Kenneth Snelson on Silicon Graphics Personal Iris hardware and Wavefront Technologies software.

## Word play

**Outsourcing:** Have MIS, will travel

**Cooperative processing:** Harmonic convergence for computers

**Migration path:** "And where it stops, nobody knows"

**Flash memory:** Where they stored the Windows-OS/2 agreement

**Enterprisewide computing:** Boldly goes where no LAN has gone before

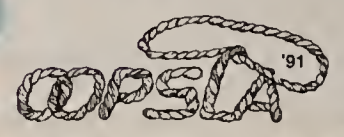
*Fore your information*

**F Y**

Cray Research, Inc. and MacGregor Golf Co. have teamed up to drive high technology into the golf industry. Cray is using its Y-MP supercomputer to help MacGregor design light, large-head titanium clubs for straighter shooting. The supercomputer simulates what happens when a titanium golf club strikes a golf ball at 100 mph — the approximate speed of a normal swing.

## UNUSUAL INDUSTRY LOGOS

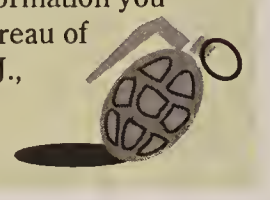
Our LIPS logo stands for the AI term Logical Inferences Per Second
From Extended Intelligence, Inc.




From the Object-Oriented Programming Systems, Languages and Applications Conference

### Put it beside your copy of *Soldier of Fortune*

"Whether you're planning a coup in South America or just checking the terrain in Tehran for a tete-a-tete, the *Multimedia CIA World Fact Book* has the information you need." The CD-ROM disk, put out by the Bureau of Electronic Publishing, Inc. in Parsippany, N.J., runs on a PC or Macintosh and costs $99.



### Winner: Most unusual use of the Dalai Lama in a press release

"At last! A scalable font package based on one of the most closely guarded and powerful Tibetan secret . . . common sense"
— *From a Lasertools press release*

Janell Genovese

▶ Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Zottola or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

Sources: Woman's Bureau, U.S. Department of Labor; *Word Watch*, Pearson Communications and The Delahaye Group; Special thanks to the Computer Museum, Boston.

# INSIDE LINES

### Straight from the hacker's mouth

▶ Law enforcement officials are better trained to investigate computer crimes, according to Robert Holland, a special agent for the U.S. Air Force's Office of Special Investigations. While on a panel at the federal government's recent 14th National Computer Security Conference, Holland mentioned that some of the Air Force's computer crime investigators who were "trained from a couple of hackers in the field" then passed that knowledge on to other agents.

### Just couldn't stay away

▶ Michael Swavely, formerly Compaq's president of North American operations, will probably resurface in the computer industry this week, accepting a director's position at a California hardware firm. Swavely confirmed he has had discussions about such a position but refused to give any details.

### Desperately seeking GUI

▶ As Comdex draws nearer, we're hearing reports that IBM may try to push up the release of OS/2 2.0, whether it's really a "better windows than Windows" or not. We're also hearing that IBM is specifically rewriting its take on the Microsoft Windows Standard Mode kernel to enable the Windows 286 Standard Mode to run under Presentation Manager. That means that when a user clicks on a Windows icon in Presentation Manager, the application will start, and Presentation Manager will protect it. Despite all the bad press OS/2 gets, Brian Livingston, president of Windows Consulting, claims that Fortune 500 firms are "desperately seeking" OS/2 2.0.

### File's in the mail

▶ E-mail will be one big theme at this week's Networld in Dallas. Expect AT&T's Easylink service to reach out and touch notebook computers at the show. AT&T will also announce what it claims is the first wireless E-mail service, for use with notebook computers. And Intec Systems will announce its "Interorganizational Communications Platform," or wide-area messaging hub, that is supposed to interconnect everything from laptops to voice response to handheld systems via E-mail and EDI.

### Grid joins SL crowd

▶ Grid Systems will today unveil a new version of its Gridpad pen-based computer. The 5-pound GridpadSL is a tablet machine that uses Intel's speedy 20-MHz 80386SL chip, which was specifically designed for portable computers. The original Gridpad used the older and slower 8086 chip. Pricing is expected to be in the $5,000 to $7,000 range when the machine becomes available in the second quarter of 1992. Grid Systems is also expected to announce that it will license its Penright application to computer makers who would like to use it to create new software programs.

### Yes, but it makes a lovely coffee table

▶ It seems that IBM is so anxious to sell big iron that it is holding yard sales on 4300s. A consultant tells us that one of his clients boasted of bagging a brand-new IBM 4341 for $2,500. "Of course, you then wind up paying $3,000 to $4,000 a month in maintenance fees," our source points out.

### Friends in need

▶ Forrester Research analyst Stuart Woodring is predicting that IBM will turn to Lotus to supply an application suite now that the IBM Desktop Software group is headed for the trash. IBM might also purchase an equity stake in the software developer, Woodring said, pointing out that the two are working together on OS/2, 1-2-3 for IBM mainframes and Notes. Lotus also took steps recently to weaken its "poison pill" by moving the trigger from a 10% to a 15% stake.

*If parents actually knew what their children were doing with their computers, maybe computer tampering would not be such a problem, according to Donald Delaney, a New York State Police computer crime investigator. "In 25 search warrants we have investigated, we did not find that the parents knew what their kids were doing," he said. Our new news editor, Alan Alper, certainly knows what his 18-month-old is doing, and she's not prowling around Defense Department computers — yet. Put his mind at ease by phoning him with a tip at (800) 343-6474, fax him at (508) 875-8931 or Compuserve him at 76537,2413.*

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